

Genus Radaka, Garrett. 466
Probably a Saroid 205

Body oblong, elongate, compressed.

Head large, compressed; mouth with a deep gape which extends far behind the eyes, and the lower jaw the longer. Teeth recurved, subulate and exist on the jaws, palatines and pharyngeals. Branchiostegal ray six, slender. Opercular bones covered by the integuments and neither spined or serrated. First dorsal contiguous to the second, situated over the abdominal space and composed of slender flexible spines. The second dorsal and anal long and the caudal is forked. Pectorals large, ovate. Ventrals are situated just in advance of the pectorals.

Radack Sauruoides, Garrett

B. 6; D. 10-29; A. 26; V. 6; P. 12; C. 19. several ^{mentary}

A single mutilated example of this singular fish now before me, is much discolored by the spirits, so that we can form no conjecture of its normal colors. It was captured some distance from land in the vicinity of the Radack Is. In appearance it is not unlike a Saurus, particularly its ample mouth, subulate teeth, and long head. But its long soft dorsal will at once remove it from, not only that genus but from the same family. Notwithstanding some of its negative characters it will probably come in the family Percoidea. Unfortunately



the condition of the specimen was such that I could not study its anatomical structure.

The body is elongate, scaly? and tapers away from the thoracic region to the caudal fin. The head is very long, comprising a third of the total length, excluding the caudal fin. The upper and lower outlines are gently curved, and the superior surface is rugose. The eyes are small, ~~slitlike~~, oval, and situated a little more than their own length from the end of the snout. Nostrils double, the posterior one ovalish, situated immediately upward and forward of the center of the eye; the anterior one is smaller than the posterior, more oblong and situated midway between the end of the snout and the anterior limb of the orbit. The gap of the mouth extends nearly two-thirds the length of the head, and the slender maxillary nearly touches the hinder margin of the gill covers. The ~~lower maxillary teeth are~~ ^{recurved subulate,} ~~disposed in two rows, the inner row the longest and not extending so far back as the outer ones~~ ^{the eyes a faint line} beneath the eyes, and all seem to be mobile. On either side, near the end of the jaw may be seen several irregular teeth, all small except one which is considerably prolonged, and the front one which is hooked is not mobile.

The teeth are all subulate, recurved and those in the lower jaw are disposed in two series, ^{though in} the inner row much the

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longest, not extending so far back as the external series, and the third one is prolonged into a fang. Two similar rows of teeth arm the upper jaw, the inner row interrupted beneath the eyes, and the ends of both jaws have a several irregular teeth some small and others hooked. A single row arms the palatines. All the teeth seem to be mobile except two of the irregular anterior ones in either jaw. Mucous pores may be observed scattered over the top and sides of the head, and a series along the lower edge of either of the lower jaw. The lateral line, which consists of a shallow groove, fades gently to the median line of the body, whence it runs straight to the tail.

The first dorsal ^{fin} commences at a point a trifle posterior to the base of the pectorals and passes over a base nearly half the length of the second fin. It is supported by ten very slender, flexible rays, of which the fourth is the longest, giving the fin an oblique arched outline. (The interradial membrane is entirely gone

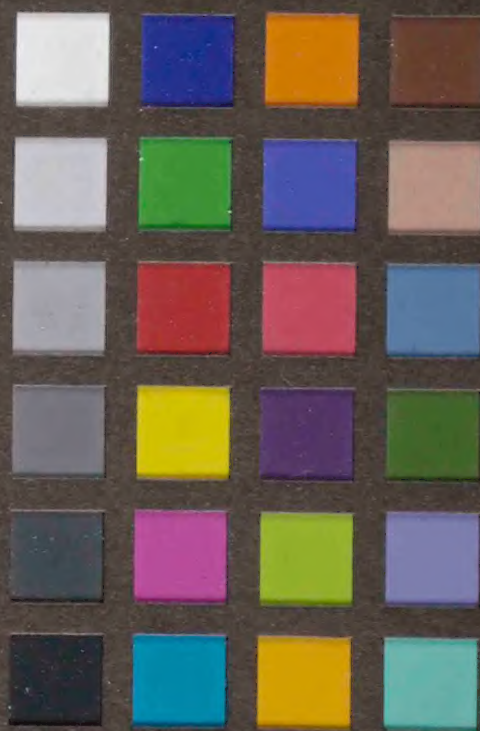
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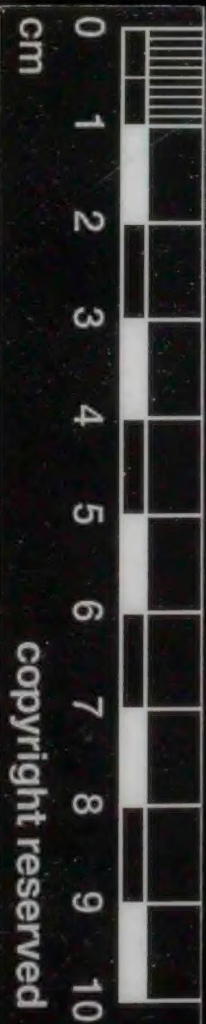
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in our specimen) The soft dorsal commenced a little nearer the caudal base than the end of the snout and passes over a base nearly a third of the total length of the fish. The anterior rays are graduated up to the fourth, which is the lastest, whence the fin tapers away posteriorly. Its height is about equal to the length of the first dorsal base. The anal fin is consimular and coterminous with the fin above, but a little shorter on its base and not quite so deep as that fin. The ventrals reach posteriorly half the distance from their own base to the anal fin. ~~Their~~ anterior ray as well as that of the anal is plexile. The pectorals are long, their tips reaching back as far as the second dorsal. The caudal fin is profoundly forked.
Length 4 1/2 inches.

~~may be seen several irregular teeth, all small except one which is considerably prolonged, and the front one which is hooked~~
~~is not mobile.~~

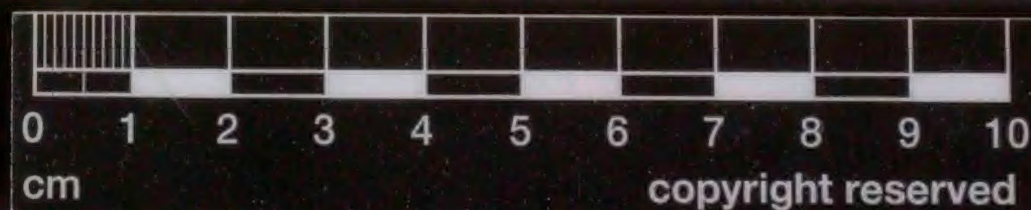
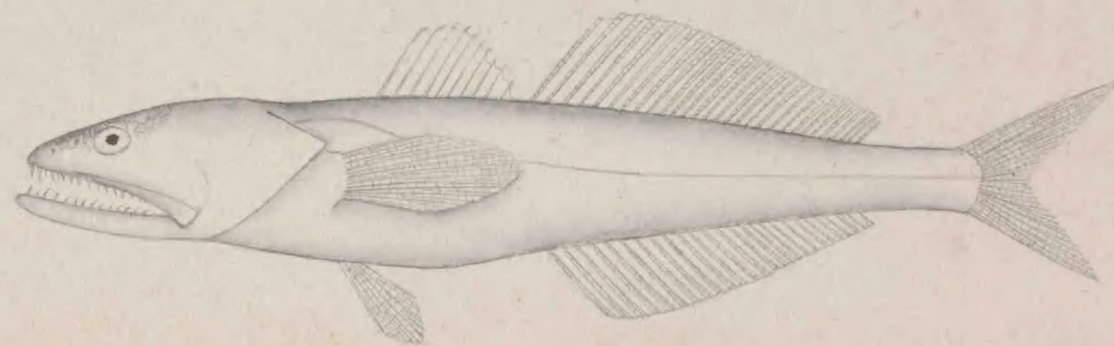


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Family Trachinidae, Bonap.

This family is characterized by the dorsal fin occupying nearly the whole length of the back, and by the position of the ventrals, which are inserted in advance of the pectoral fins. Their teeth are velvet-like and ~~sometimes~~ sometimes with canines intermingled.

Genus Eleotriperca, Garrett.

Form elongate, fusiform, the anterior portion depressed, the middle cylindrical, becoming compressed posteriorly. Head long, pointed as viewed in profile, wider than deep. Mouth moderate, slightly oblique; lower jaw the longer, and both armed with a band of small hooked teeth and a few canines intermingled. Lips fleshy. Eyes inserted nearly on the top of the head, so as to look upward. Two small nearly similar nostrils just in advance of the orbit. Preopercle with three or four small stout spines. Opercle and subopercle each armed with a stout spine. Gills united under the throat by an isthmus. Branchiostegal rays six.

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Scales minute, ciliated, enveloping the basal portion of the caudal, and part of the head. The two dorsals united at their bases; the spiny one very small, the soft, together with the anal very long and serrated along their margins; no spiny rays to the latter fin. Ventrals far in advance of the pectorals, very long Eelotris-shaped and without any spiny rays. Pectorals elliptical. Caudal truncately-rounded.



Percis tetracanthus
Eleotriperca cancellata, Garrett.

B. 6; D. 4-21; A. 18; V. 6; P. 17; C. 2, 1, 7, 6, 1, 2.

As viewed in profile the upper and lower outlines are gently and similarly arched. The greatest depth of the body, which is beneath the origin of the soft dorsal, is as compared to the total length of the fish, three to twenty-two. The greatest thickness at the base of the head is a trifle more than the above mentioned depth. The head comprises a fourth of the entire length. The posterior tip of the maxillary, which is covered by the integuments, reaches a vertical touching the anterior border of the eye. Eyes sub-circular, rather large, prominent, their greatest diameter entering four times and a half in the length of the head. The small spiny dorsal commences immediately above the base of the pectorals, and with the second fin passes over a base nearly half the length of the fish; its second spiny ray is the tallest, being less than half the length of the base of that fin. The soft dorsal and anal



rays are scarcely divided; their margins are very slightly convex and both are coterminous. The height of the former as compared to length of base is as one-to five. The latter commences opposite the fifth soft dorsal ray and is about the same height as that fin. The ventrals when laid back overlap the vent, being half as long as the anal base. The pectoral rays are bifurcate, and the fin extends posteriorly as far as the anal. The caudal is as long as the pectorals.

Color of the upper parts greenish-gray passing into white beneath. Body longitudinally and transversely barred with brownish-olive, which gives it a somewhat checkered appearance. Head irregularly maculated and striped with brown. Irides silvery. Ventrals and pectorals pale yellowish. Dorsals obscurely mottled with dusky. Anal with a livid tinge along its lower margin. Caudal variegated with deep brown and opaque white on a pale ground.

Length, 6 inches.

Habits.—Society Isls.

Remarks.—Not common. Vernacular name "Mo" or Lizard fish.

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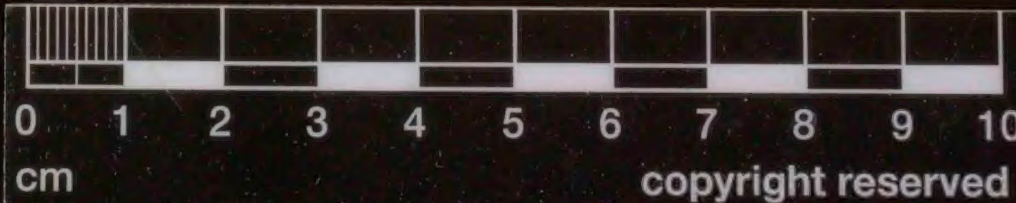
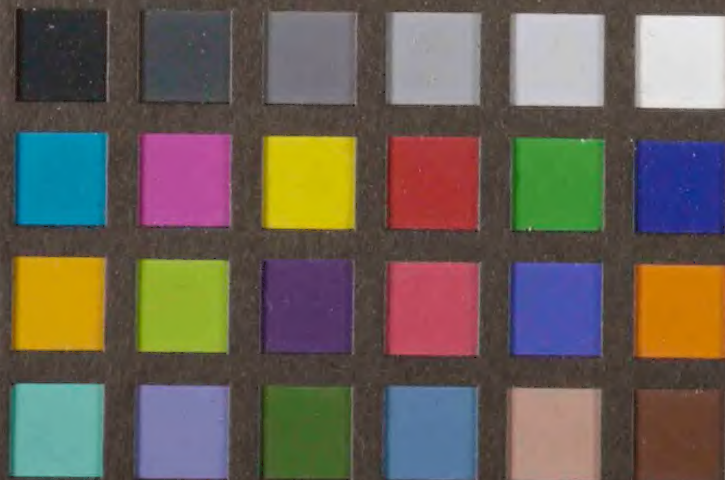
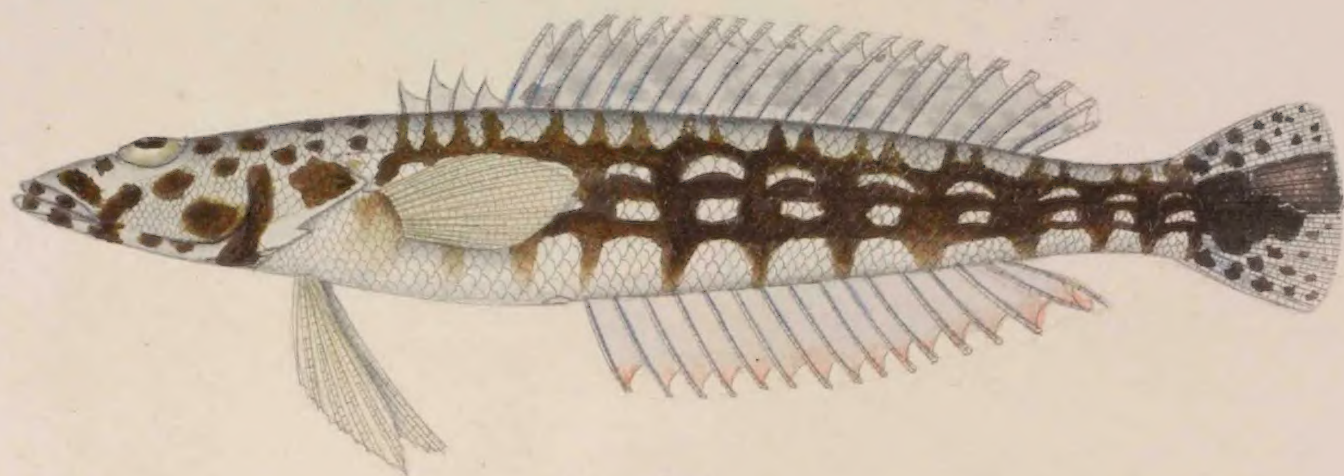
Percis tetracanthus

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Percis tetracanthus

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Taf. 93 Fig. B



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Genus *Halacanthus*, *Linnaeus*.

Body elongate, compressed. Scales small. Head rather small, scales on the cheeks and behind the eyes, and the opercle terminated in a stout flat spine. Lateral line continuous. Dorsal and anal very long, with but few anterior slender flexible rays.

The genus may be known by their slender forms, long dorsal and anal, and spined opercle. *Linnaeus* says their maxillary teeth are similar to Labrus, and their pharyngeal teeth are like those of a carol as in *Chromis*.

Koestlin

Halacanthus bifasciatus, *Günther*

B. D₃-53; A₁-45; K₁-5; P₁-5; C₁-1, 2, 3, 4, 5.

This species is very slender, the body gradually tapering from the origin of the dorsal fin to the tail. The greatest depth is a little less than the length of the head, which latter equals one sixth of the fish. The scales are very small. The lateral line is slightly

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snout and bends down as in feeding,
at a point opposite the middle of the
dorsal fin. The top of the head is flat
and, rather obtuse in front, and the
upper profile is arched. The eyes are large,
their diameter equalling two-sevenths the
length of the head, and are situated
so that a vertical line from the anterior
tip of the maxillary just cuts the anterior
rim of the orbit. Just in advance of the
eyes are two nasal orifices, the posterior
the larger, and the anterior slightly
tubular. The lips are loose and fleshy.

The dorsal fin commences immedi-
ately above the base of the pectorals
and extends within a short distance of
the caudal. The rays are all undivided,
slender, the anterior ones low, but grad-
ually increasing in height to the twen-
ty-second or twenty-third, where the
fin almost insensibly tapers posteriorly.
The anal starts from a point opposite
to the eleventh dorsal ray, and termi-
nates with that fin. The ventrals are
small, placed beneath the pectorals,
and when closely appressed to the belly,
their tips do not quite reach the
vent. The pectorals are rather large

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somewhat oval in shape, in consequence of the rays being graduated either way from the sixth vertebra extending from above. The upper and lower hinder angles of the caudal are slightly produced into triangular points, though its middle portion is convex.

The upper half of the body is of a dusky olive, the lower parts pale grayish, the former color descending in oblique diffuse bars. The upper half of the head is greenish fawn, dotted with yellow. Sides varied with blue, yellow and silvery. The dorsal and anal transparent golden yellow. Caudal yellow, with two horizontal diffused black stripes enclosing a white line.

Length 10 to 12 inches.

Habitat - Sandwich Is.

This is a very rare fish at the above mentioned location where I procured two examples.

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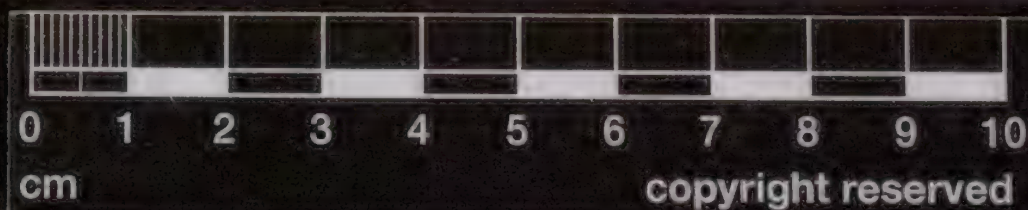
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Malacanthus hoedtii

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Chironectes cirrhosus, Garrett.

D. 13; A. 7; V. 5; P. 10; C. 1, 5, 4, 1.

Color pale greenish yellow, with darker clouds and mottled with bluish white. Frides with pale radiating bands. Cirrhi whitish.

The general outline is oblong oval, and the dorsal region is but slightly arched. The integuments are finely granulated, and furnished with little-fleshy simple or branched cirrhi, which are the most developed on the head. The first horn-like process above the eyes is rather larger than usual, and is profusely decorated with branched cirrhi. The cornea is reniform. The pectoral and ventral rays project considerably beyond the interradial membranes.

Length, $1\frac{1}{2}$ inches.

Habitat.—Society Isls.

Remarks.—We have seen two specimens of this singular species, both of which were captured in clumps of coral.

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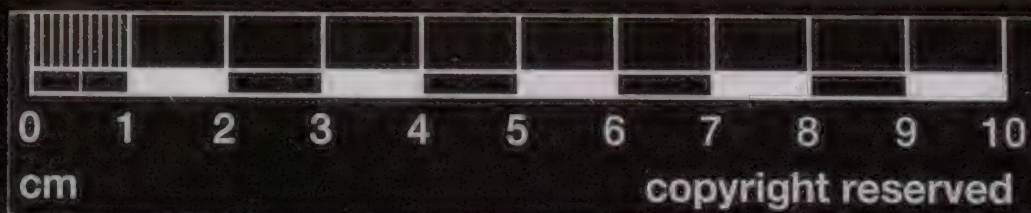
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Antennarius marmoratus

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Chironectes Sandwichensis, Bennett

Chironectes Sandwichensis, J. O. Bennett,
Whaling Voy., Vol. 2,
p. 258, et fig.

This species belongs to the same group as C. leprosus and C. niger, and may be distinguished by its uniform lemon yellow color, and marked with a few remote, small round pale blue spots. The only example which I have seen, I captured on the east coast of Hawaii, one of the Sandwich Isls. At the time I discovered it I neglected to draw up a description, but fortunately made a colored drawing.

I presume it is Bennett's species, obtained by him at the Sandwich Isls. His wood cut is badly executed and his description refers mostly to the generic characters.

The drawing is natural size, but the number of the fin rays are doubtful. It is shaped much like C. leprosus.

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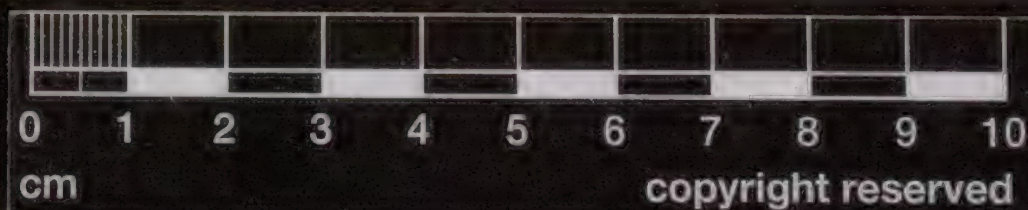
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Chironectes leprosus, Eyd. & Sol.*Chironectes leprosus*, Eyd. & Sol., Zool.

Voy. Bonite, Vol. 1, p. 187,

pl. 5, fig. 3.

D. 12; A. 8; V. 6; P. 10; C. 1, 4, 3, 1.

A single specimen of this *Chironectes* now before me has been several years in spirit, and is much changed in color, which is wood-brown, with large patches of grayish, and spotted with black. The spots are round, small, with the exception of two at the base of the dorsal and ventral fin.

The integuments are covered with fine crowded rigid asperities, like pile on velvet, and scattering scabrous papillae.

Length, $4\frac{1}{2}$ inches

Habitat.—Sandwich Is.

Remarks.—Eydoux and Sonlignet obtained their specimen at the above location. They give the ground color blackish-brown.

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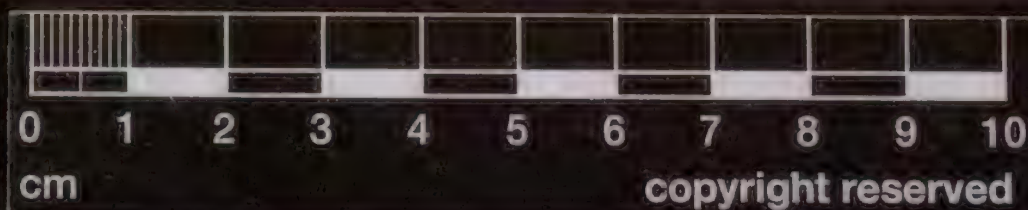
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Chironectes ^{commersonii} *niger*, Garrett.

Chironectes niger, Garrett. Proc. Cal. Acad.
Nat. Sciences, p. 107

D. 3-12; A. 6; V. 5; P. 10; C. 1, 7, 1.

The head constitutes about one-third of the total length, caudal exclusive. The eyes are elliptically oval, and inserted just once their greatest diameter distant from the margin of the upper jaw. The skin is covered with fine closely set prickly asperities, which gives it a velvety appearance. The general outline is ovate, and the greatest thickness equals one-sixth of the entire length. A range of conspicuous pores commences on the upper part of the gill covers, curving downward and forward, and terminating at the symphysis of the lower jaw. A second row follows the margin of the upper jaw, passing over the snout, and branches off posteriorly, curving over the eye and disappearing on the posterior part of the body. Each pore is encircled with brush-like asperities which resemble little tufts. The dorsal fin extends over a



a base equal to one-third the length of the fish. Its upper margin is arched, and its height as compared to length is as one to two. The anal fin is about equal length and depth.

Color deep black and obsolete, maculated with rather small roundish darker spots. On the basal portion of the dorsal and anal fins, may be observed two large ocellations, with deep black pupils and paler areolae. Very minute opaque white points may be seen along the lower parts of the body.

Length, $3\frac{1}{2}$ inches.

Habitat:—Sandwich Is.

The dorsal fin is considerably more arched than in *C. leprosus*, and entirely different in color.

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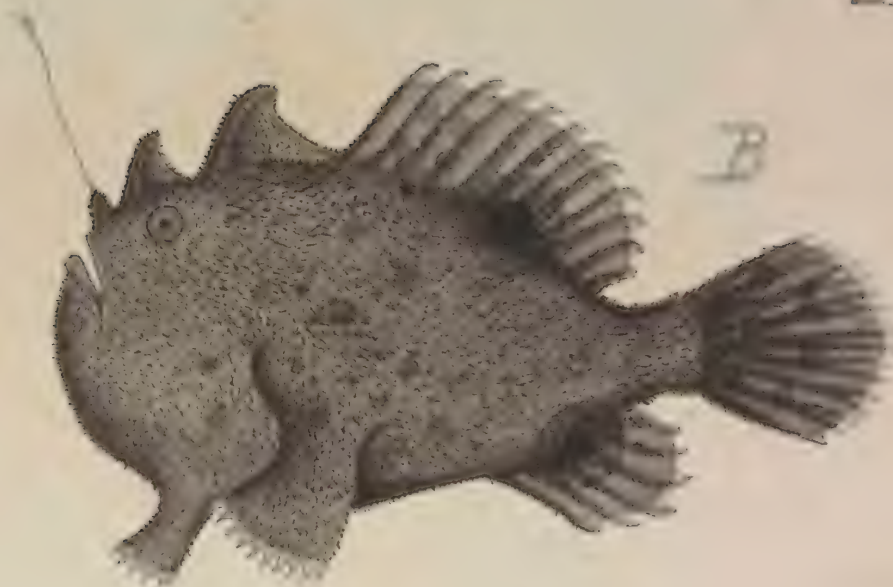


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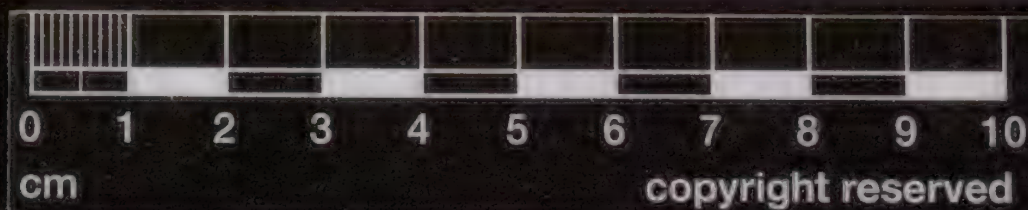


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Antennarius commersonii



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commersonii var.Chironectes horridus, garrett.

D. 12; A. 4; P. 10; V. 6; C. 1, 4, 3, 1, 1.

Color uniform dingy red, clouded with dusky-gray, and maculated with different sized, roundish deep black spots, which are the most developed on the abdomen, and vertical fins. Sides dusky-red, with a vermilion ring near the oral corner. Integuments very lax, and asperous.

Length, 7 inches.

Habitat. Society Isls.

Remarks.—A single specimen was brought to me by the natives at Huahine one of the Society Islands. It was badly mutilated on the upper part of the head. It differs from C. tabitensis in color and markings, shape, and the anal fin is smaller than in that species. It is also quite different from C. rubro-fuscus in the markings, shape of the body and position and shape of the eyes.

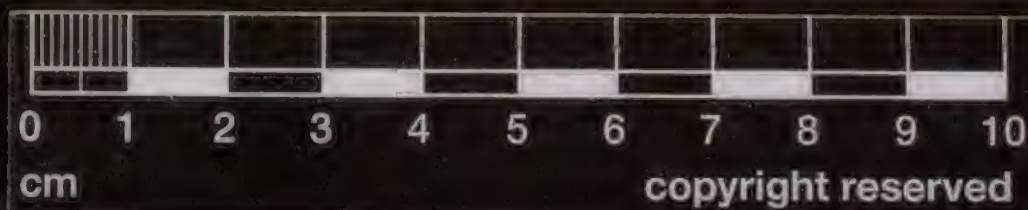
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Chironectes rubro-fuscus, Garrett.

Chironectes rubro-fuscus, Garrett, Proc. Cal. Acad.,
Vol. 3, p. 64.

A single example of this species now before me has been preserved in spirits several years. It is in fine condition though the colors are much faded. Its whole surface is covered with crowded minute hispid asperities, and very small remote cutaneous tuft-like appendages. The eyes are exceedingly small, elliptically oval in shape, their length being only three-twentieth of an inch. Their distance from the nearest margin of the upper jaw is five times their own length. The general outline is oblong-ovate, the chin prominent and rounded. The anal fin is small, its depth and length about equal.

The color as noted from the living fish is dark red, with irregular cloud-like markings and spots, dusky-gray. Everywhere maculated with small irregular dusky spots which are most numerous along the belly, a few deep maculations on the vertical fins and scattering ones may be observed on the body.

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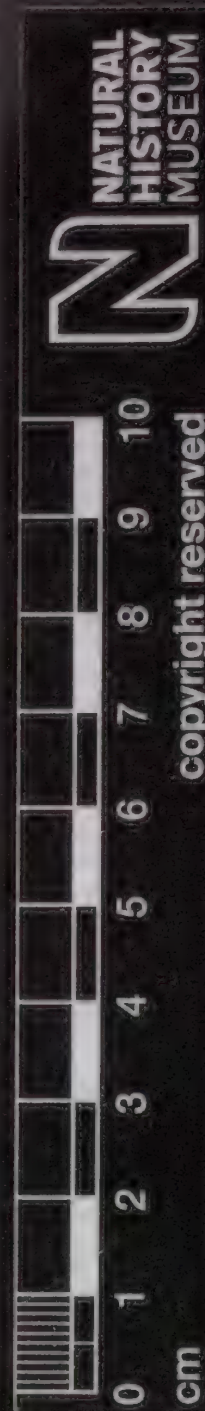
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The interior of the mouth is mottled with red and white. Irides pale flesh color; cornea black. The smooth inner surfaces of the ventrals and pectorals are entirely red.

Length, 4 1/2 inches.

Habitat. - Sandwich Isls.

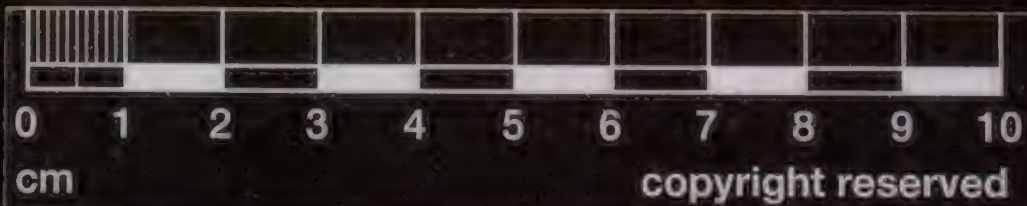
Remarks. - This fine large species is very rare. It may be distinguished from the Chironectes leprosus by its much larger size, more compressed body, different color and smaller eyes.



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Chironectes nigro-maculatus, Garratt.

D. 12; A. 7; V. 6; P. 10; C. 1, 5, 4, 1.

Color black; remotely clouded with dusky-gray, and marked with a few scattering large round deep black spots. Irides light coppery-yellow. Cornea small, elliptical in shape. Integuments asperous.

Length, 6 inches.

Habitat.—Society Isls.

Remarks.—We obtained a solitary example of this species at the Society Islands. It differs from C. Tahitensis in the size of the eyes, shape of the anal fin and the deeper emargination in the posterior membranes of the two stout anterior dorsal rays.

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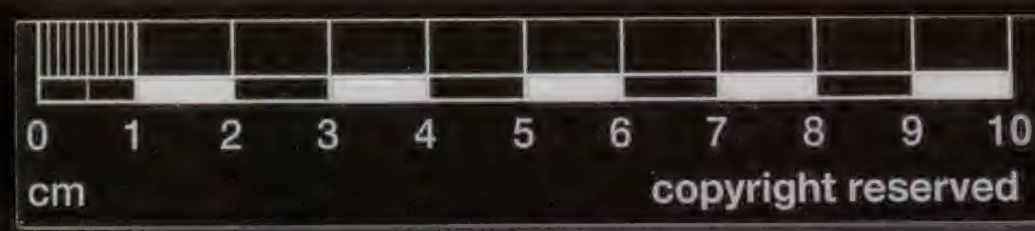


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Chironectes Jubilentis, Garroth.

D. 3-13; A. 8; V. 8; P. 11; C. 9.

This large species is of a roundish ovate form, considerably compressed, and the lax integuments are as it were shagreened. The whole fish is of a deep black, with grayish marblings which resemble those Cryptogams growing to the trunks of trees, and have as lichens by Botanists. On the caudal fin they assume vertical interrupted lines. The marblings are more or less tinged with yellowish or reddish. The sides are copper yellow, with whitish yellow radiating lines. The interior of the mouth is bluish white and the tongue is marked with white and brown. The eyes are horizontally oval, the cornea the same shape, and situated twice the diameter of the orbit from the end of the upper jaw. The anterior filament is one inch long. The two succeeding rays are rather strongly curved, stout and their posterior membranes extending to their tips.

The dorsal fin commences at a

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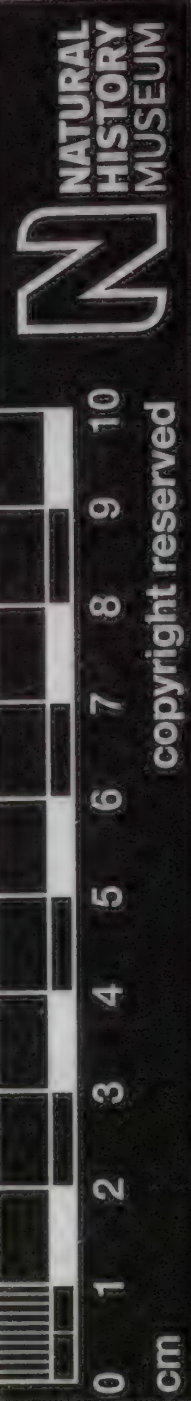
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point exactly midway between the anterior portion of the fish and the hinder termination of its over base. Its height is a trifle less than half the length of its base, which latter is a little more than one third of the fish. The ten first rays are simple and the three posterior bifid. The anal is little more than half the length of the dorsal, more arched and inserted much nearer to the caudal. The anterior ray is undivided, the others bifid. The caudal, which has bifid rays, is rounded posteriorly.

Length, 3 inches.

Habitat: Society, Isles.

This species, which I obtained at Tahiti, one of the above group, may be distinguished by its large size, deep body, and peculiar color and markings.

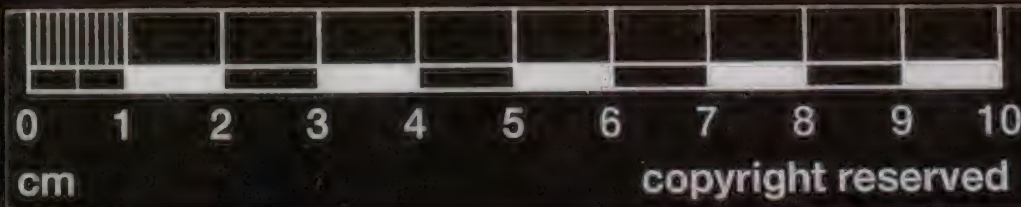




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commerstonii, var.

Chironectes argus, Guér. & G.

V. 12; A. 7; P. 6 to 7; L. 6; C. 1, 4, 1.

This species is of a grayish brown or dusky form, with darker shades, and clouded with cream color. The whole fish is maculated with distinct roundish black spots, each encircled with a white ring. The interior of the mouth is beautifully mottled with white on an olive colored ground. Fides cupreous yellow, and marked with a circle of black dots.

The general aspect of this fish is ovate, and the skin is covered with closely set minute prickles, which are not very pungent to the touch. Interspersed among the asperities are many he observed a few tufted cilia. The eyes are very small, circular.

Length, 6 inches.

Habitat: Society Isls.

As compared with C. Tahitensis, the membranes of the two stout anterior dorsal rays are more deeply emarginate and the anal is shorter and more arched.

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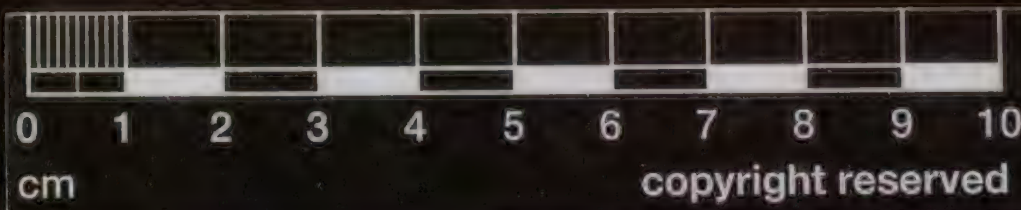


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Chironectes unicornis, Bennett.Antennarius unicornis, Bennett, Zool. Jour.
V. 3, p. 374, pl. 7, fig. 1.Chironectes reticulatus, Eyd. et Saul., Voy.
Bonite, Zool. p. 156, pl.
5, fig. 2.

D. 12; A. 7; V. 5; P. 11; C. 1, 4, 3, 1.

The prevailing ground color is buff yellow, except the anterior and upper portion of the head which is of a carnation hue. The former color is covered with brown veins, which, on the body assume a reticulated appearance. The body is also marked by large cloud-like deep brown spots, and a transverse band of the same color may be observed on all the fins except the dorsal. The veins, together with a few mottlings on the head fulvous. Lides greenish; cornea black, reniform.

Integuments asperous. The general outline is obese ovate and rapidly tapering behind. The horn-like process above the eyes is slightly curved, tapering and rugose. The large process near the dorsal fin is so buried in the integuments as to present only a rounded tubercle. The dorsal fin is long, rather low, and united

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to the caudal.

Length, 2 inches.

Habitat.—Society Isls, Sandwich Isls,
Panmote Isls, Madagascar.

Remarks.—We obtained one specimen
of this species at the Society, and three
at the Panmote Islands. Mr. E. F. Bennett
^{who} first described and figured it in 1827, says
it was brought from Madagascar. Moll.
Lydon and Seale, in their Zoology of the
Voyage of the Bonete, gives a better figure
of this species, though under a new name,
and much more appropriate than that
of Bennett. Their specimen was obtained
at the Sandwich Isls.

Bennett's ray formula is D. 12; P. 11; V. 5; A. 7; C. 9.

Lydon & Seale = D. 3-13; P. 10; V. 5; A. 8; C. 11.

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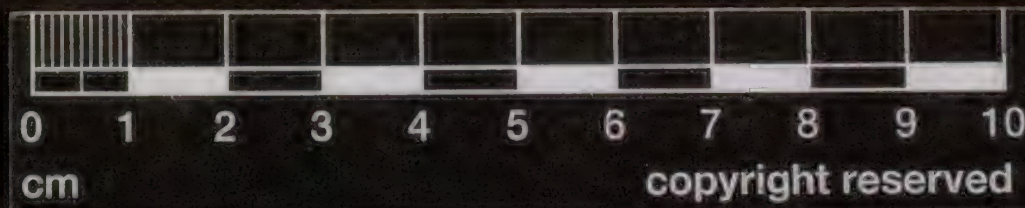
217



No. 105 f. B

Antennarius bigibbus

112



NATURAL
HISTORY
MUSEUM

*sigillatus, albino*Chironectes thursites, Garrett

D. 2; A. 7; P. 11; V. 6; C. 1, 8, 1.

Color lemon yellow throughout. Irides golden yellow. The tips of ventral and the pectoral rays are brown, and each fin is marked with a transverse band of the same color. A similar band traverses the basal half of the anal, and three vertical ones mark the caudal.

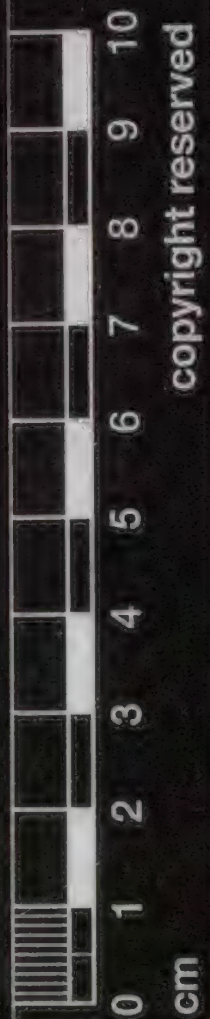
Length, 2 inches.

Habitat: Kingman's Isls.

I can give no further description of this species, in consequence of having sent away the only specimen obtained, after making the colored drawing.

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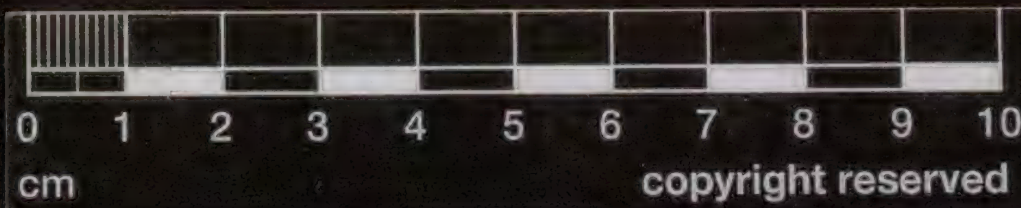


213



Antennarius ligibbus

105



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HISTORY
MUSEUM

10^{mm} long
probably young of some speciesChironectes parvulus, nov. sp.

D. 3-12; A. 6; V. 6; P. 10; C. 17, 1.

The integuments are shagreened, among which are interperforated many little conical papillae. The general outline of the body is oval. The living fish is blackish, which changes into olivaceous green when dead. Scattering white dots and a few small black spots decorate the body and two vertical bars of the latter color mark the caudal fin. The eyes are circular, and situated a little more than one their diameter from the end of the upper jaw. The spine above the eye is armed with little prickles, and the membrane which unites it to the succeeding ray is very small. The membrane to the occipital spine is large and but little emarginate. The dorsal is longer, but not so deep as in *C. latidorsus*. The rays of the ventral and pectorals project much more than usual beyond their membranes. Length, 13 lines.

Habitat: Society Is.

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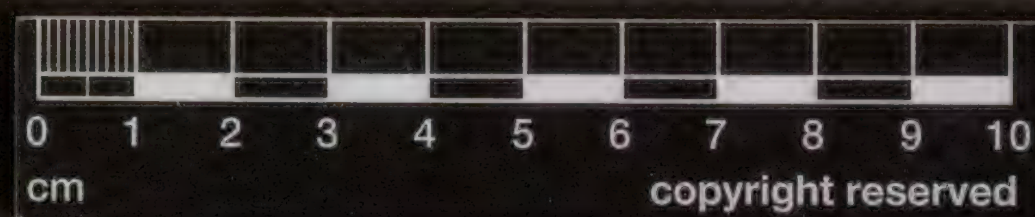
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387
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Antennarius



Family Triglidae

These fishes are exclusively marine in their habits. Their general character consists in having the suborbital bone more or less extended over the cheek and articulated behind with the preoperculum. Their head has a singular appearance being variously bristled, spined and covered with armor, which gives them a peculiar physiognomy.

Genus Lactylopterus, Lacép.

Body elongated, covered with crenate scales. The head is covered with a bony helmet which projects over the mouth. Teeth arranged like pavement. The preoperculum terminates in a long, strong spine which projects backwards. The approximating dorsal fin short. Ventrals posterior to the pectorals. The latter fins excessively large, a character which has given them the name of Flying Fishes.

69
orientalis, C. V.

Sactyloplarus maculatus, ~~gambus~~

P. 6; D. 1-6-7; A. 6; L. 1-5; P. 1; C. 2, 1, 1, 2, 1, 2.

The anterior portion of the body is broader than deep. The greatest breadth entering five times and one-fourth in the total length of the fish. The belly is flattened, and like the back is evenly arched in outline. The head is less than a fifth of the total length. The snout is closely punctured and terminates at the base of the head in a long stout spine, similar to the one on the preopercle. The eyes are very large, sub-circular, their greatest diameter being a little more than a third of the length of the head. The interorbital space is deeply concave and in width equals half the length of the head. The snout is quite prominent, and the upper jaw the longer. The mouth is rather small, nearly horizontal, and the hinder tip of the maxillary reaches as far back as the center of the eye. Two approximating nostrils may be seen just in advance of the eye, the posterior one ovalish, the other circular and ~~sinuate~~ tubular.

Scales of moderate size, their carinations becoming more and more dev

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HISTORY
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obtusely pointed, where their hinder edges
are denticulated. The lower portion of
of the body, on either side may be charac-
terized of the carina developed into a series of
pendages. The scales beneath the belly are
smooth and are in this articulation.

At a point about midway between
the eyes and base of the pectorals, rises
a long filamentous ray, with a small
further membrane; when laid back its tip
reaches back as far as the second dorsal
fin. The spiny dorsal is composed of six,
slender rays, the first nearly as tall as the
second, which latter is the highest, the
others rapidly diminishing to the last which
is very small. Its height is less than the length
of its own base. The soft dorsal, which is the
same height and length as spiny, tapers
away posteriorly. It says one unbranched, except
some of the last which are bifid. The anal,
which is opposite to the soft dorsal, is
rather smaller than that fin, which it
resembles in structure. The ventrals when
closely appressed to the belly reach the
vent. The pectorals have undivided rays,
the longest of which extends as far back
as the hinder margin of the caudal.
The caudal is truncate and its rays are
bifid.

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The dorsal region is pale greenish-gray; sides silvery-gray and belly flesh-white with a more or less livid tinge. A few large round brownish-red spots along the upper half of the body and head. Two obsolete bands of the same color descend from the eye. Sides reddish-brown. The long filament is blackish. Anterior dorsal light greenish-ash, with darker clouds. The second dorsal and caudal are nearly transparent, ^{and have} ~~with~~ their rays articulated with greenish-yellow and reddish-brown. Ventrals flesh color. Anal pale, with an anterior reddish-brown diffused spot. The pectorals are pale greenish-gray, with darker clouds and evenly maculated with rather large round reddish-brown spots.

Length, 8 to 10 inches.

Habitat. Sandwich Isls, Society Isls.
Pinn. Isls.

Remarks. This curious fish seems to be rare at all the above locations. At Tahiti where we obtained the specimen figured, it is called by the natives "Apa-
apa-ai"

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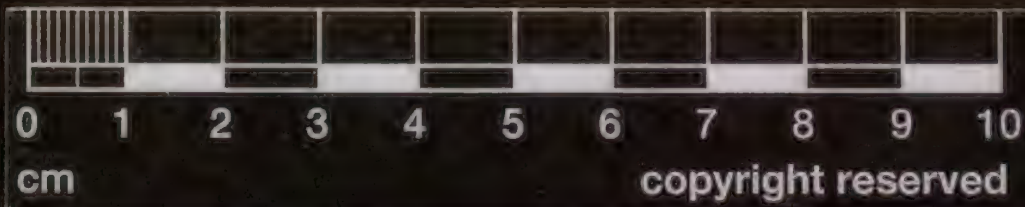
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220

Dactylopterus orientalis



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genivittatus, C. D.

Gobius multivittatus, Garroff

221

D. 4; L. 5-12; A. 12; P. 15; C. 5, 7, 8, 9

This species is rather slender, the body gradually tapering posteriorly from the origin of the first dorsal fin, and becomes considerably compressed. The greatest depth is one-sixth of the total length, and the scales are of moderate size, suboval and extend forward over the occipital region. No apparent lateral line. The head comprises one-fifth of the fish, the upper line of profile, rises precipitately from the snout, suddenly curves over the eyes and runs with a gentle ascent to the first dorsal fin. Cheeks swollen. The eyes are of moderate size, suboval, even with the upper line of profile and their greatest diameter extending about three and a half times in the length of the head. The hinder tip of the maxillary reaches a vertical line touching the hinder border of the eye. The mouth is slightly oblique, rather deeply cleft, the upper jaw a little the longer, and both armed with bands of fine crowded slightly hooked teeth. The first

dorsal fin is composed of six slender, flexible rays which are prolonged above their connecting membrane in short filaments, and the fin is longer than high. The soft dorsal is a little removed from the first, and is very large, having a base one-fourth the length of the fish and deeper than the first fin. The rays slightly increase in height posteriorly, so that the upper margin is horizontal, and the last ray which is double ranked

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when bent back behind the base of the caudal fin. The similar anal is simply shorter than the fin above. The caudal is broad lanceolate and longer than the head. The ventrals are pointed, long, their tip reaching the anal papilla. Pectorals large, shaped like the caudal and their tips reach as far back as the anal papilla.

Color pale bluish gray passing into bluish silver beneath. All the scales on the upper two-thirds of the body marked each with an oblong vertical black dot. Flanks with about twelve, equidistant, vertical silvery bars, which are narrower than their interspaces and do not quite reach the lower edge of belly. Head olivaceous, bluish gray beneath and a large black band extends obliquely downward and backward from the eyes. Iris pale brown. All the fins are more or less tinged bluish gray, the two dorsals mottled with short undulating and zigzag black lines.

Length, 4 inches.

Habitat: San Diego Is. and Abasco.

Note. A rare species at both locations. Both drawing and description are from a single example from the fresh water streams of the latter group of islands.



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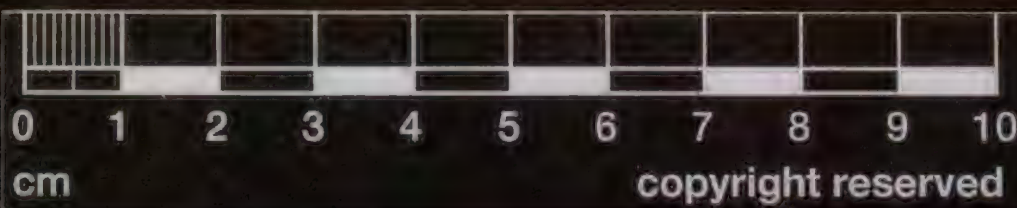
221



Original for Prof. W. C. C.

Sobrius genivittatus

122



N NATURAL
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Genus, *Acanthogobius*, Garret

Body oblong, compressed, covered with moderately sized, which are not continued on the head. No visible lateral line. Head well developed. The preopercle, which is free on its posterior and lower border, is armed with two little spines on its angle. Mouth small, oblique; jaws armed with uniform closely-set villiform teeth, disposed in bands, and an external row of longer slightly hooked ones. Gill apertures united by a wide isthmus. Branchiostegal rays four. First dorsal contiguous to the second, opposite to the abdominal space, with long filamentous rays. The soft dorsal, which is preceded by a stout spine, is longer than the anterior fin. The opposite anal is shorter than the fin above. Ventrals long, pointed, inserted just posterior to the opercle pectorals, and constructed as in the true gobies. Caudal sub-ventral.

Gobius optopomus, C. V.

Acanthogobius typicus, Garret

B. 4; D. 6/1-10; A. 11; V. 6; P. 16; C. 6, 6, 6, 6.

The upper and lower outlines are gently arched, the sides considerably compressed, and the greatest depth, which takes place at the origin of the first dorsal fin, enters nearly four and a half times in the total length. The eyes are situated high upon the head so that their upper limb is even with the upper line of profile. Cheeks not swollen.

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The head, entire about four and a half times in the total length of the fish, is well developed and the upper line of profile is arched. The hinder tip of the maxillary reaches just behind the anterior border of the eye.

The first dorsal, which is deeper than long has the rays drawn out into rather long filaments, of which the fourth is the longest. The second dorsal passes over a base equal to one fourth the length of the fish, and is gently arched along its upper margin. The anal is shorter and slightly more distant from the caudal than the fin above. The ventrals are long, equalling the length of the head, inserted immediately behind the pectorals, and when laid back reach the anal fin. The pectorals are broad lanceolate and reach as far posterior as the ventrals. The caudal is rather large, and somewhat elliptically rounded.

Color grayish-white, varied with small silvery white spots and orange yellow dots. The head is ornamented by both oblong and round bluish silver spots. Sides dusky silver; lower blue-black. The anterior dorsal is shaded with pale orange, blackish and whitish, the shades disposed transverse to the rays. Some with a few remote reddish dots along the base of the fin. The second dorsal pale, generally with a reddish shade, and dotted with bluish silver along its base. Pectorals colorless. Ventrals whitish, sometimes tipped with lead color. The anal fin is either plain

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whitish, or streaked parallel to its base with light copper-red, bluish silver and yellowish. Some times ornamented with a single row of bluish silver dots near its base, bandal with light reddish shades.

Length 3 inches.

Habitat: Society Isls.

We obtained several examples of this species in a brackish water lagoon at Haiao Is.

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Chaetodon quadrimaculatus

222

Chaetodon No 124

This beautiful Chaetodon is sub-oval in shape, and the head which comprises nearly a fourth of the total length is very precipitate and produced into a short conical snout. The large eye enters three times in the length of the head and is placed exactly midway between the end of the snout and the hinder opercular corner.

The soft portion of both dorsal and anal are very deep and angulated posteriorly, the angles reaching back as far as the middle of the caudal fin, which latter is truncate.

D. 13-23; A. 3-19; V. 1-5; P. 15; C. 3, 1, 6, 7, 1, 2.

Color yellow on the lower half of the body and blackish above, which latter line spreads over a large portion of the dorsal fin and posteriorly descends and crosses the caudal trunk. Two large oval silver spots on the black ground. Scales with brown-red dots. Head yellow. Venter band black above the eye, orange red beneath, margined with steel blue, and a black thread-like line separating the two colors beneath the eye. Dorsal

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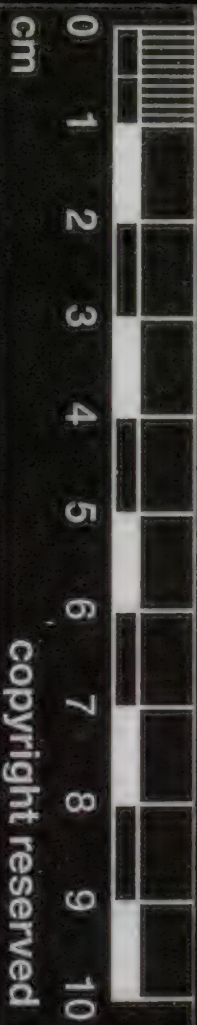


yellow. Soft dorsal with a steel blue
band edged above with black, and a similar
bar edging on the upper margin. Caudal,
ventral and anal orange, the former with
a wide steel-blue margin and an inner
black line. The latter fin is edged with
black and obliquely traversed by a
steel-blue band edged with black. The
pectores yellow.

Length 5 to 6 inches.

Hab. Sandwich Isls.

A very rare species.



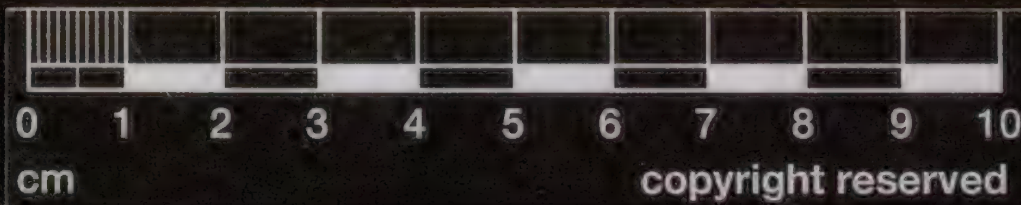
Sobrius alopomus
Sobrius alopomus

Sobrius alopomus

124



Original of Prof. H. C. L. B. after another copy



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Gobius punctatus, Garrett

B. 5; D. 6-9; A. 9; V. 1-5; P. 18; C. 3, 7, 8, 9.

The general aspect of this species is rather elongate, with slightly convex outline, and the anterior portion is sub-cylindrical, becoming more and more compressed posteriorly. The scales are of moderate size, and extend over the whole to the eyes. No apparent lateral line. The head comprises two-thirds of the fish, and the cheeks are swollen. The upper and lower profiles are convex, and the muzzle rounded. The eyes are sub-circular, approximating above, so that the interorbital space only equals half the greatest diameter of the orbits. They are inserted on a line with the upper profile, and their greatest diameter, even four times in the length of the head and even in advance of their own orbits. The mouth is oblique in its closure, and the hinder tip of the maxillary extends back as far as the center of the eye. Maxillary teeth disposed in closely-set bands, the lower jaw with larger and interrupted, and the external one on the upper jaw are much the largest, all minute and slightly hooked. Tongue thick, truncate and emarginate in front. Gill openings short, being equal to the base of the first two spines. Posterior anal appendage long and tapering.

The first dorsal, which corresponds to the subdorsal space, is slightly longer than back, and composed of six flexible rays, the second slightly overlapping the first and the others rapidly diminishing in size to give the

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the margin an oblique rounded spot. The soft dorsal rises close to the pectoral just midway between the eyes and the caudal base. It is both longer and a trifle higher than the first dorsal and the upper margin runs nearly parallel with the base. The similar anal is shorter, not so deep and a trifle more distant from the caudal base than the first dorsal. The anal ventrals are inserted beneath the pectorals, pointing, and when laid back their tips reach the vent. The expanded pectorals are reddish anal and two ends are on a plain with the vent. The large caudal is oval.

Color from yellow, darker along the back which is sometimes marked with a row of cloudlike brownish spots, and the muzzle and belly lead color or dusky, sides from the muzzle to the tail, dotted with light bluish sometimes cloudlike spots of the same hue on the body, and some a paler or darker ground color than others. Fins yellowish brown, and the cornea deep green. The caudal soft dorsal and a broad oblique band on the first dorsal light purple, the pectoral fin has its rays spotted with dull reddish, and the second dorsal is spotted with the same hue and widely margined above with whitish yellow dorsal and ventrals nearly colorless, the pectorals with a dusky outer margin. Pectorals either colorless or light yellowish.

Length, 4 inches.

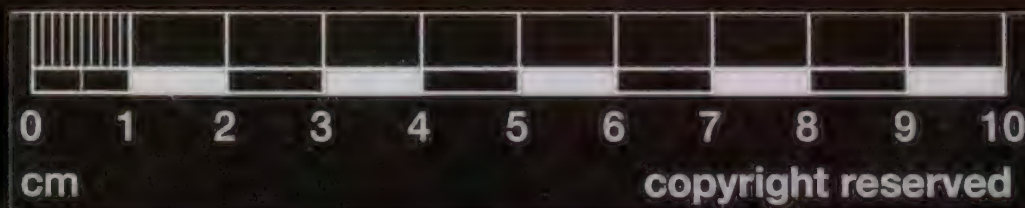
Habitat: Society Is., French Frigate Shoals, Kingman Reef. Marine species.

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semidoliatus, C. O.
Gobius No 349

D. 6-11, 'A. ?; V. 1-5; P. ?; L. ?

This minute species we have every reason to suppose to be mature even, notwithstanding its diminutive size. Nearly a dozen specimens were collected at different times among branch corals.

The general shape is elongate oblong, sub-cylindrical anteriorly, and becoming gradually more and more compressed posteriorly. The head is hooked on its upper profile and the snout is short. Mouth oblique, and the hinder tip of the maxillary reaches the anterior border of the eye, the latter organs large, their orbit even or a little elevated above the upper line of profile, and their diameter entering about a little more than three times in the length of the head. The head comprises a fourth of the fish. The teeth are slender, acute, and the larger on the lower jaw. Cheeks swollen. The scales of moderate size; none on the head, and the lateral line is well defined.

The first dorsal fin which is immediately above the abdominal space is composed of six slender flexible rays, of which the second is the longest. The soft dorsal arises close to the first, and is longer than deep, coming above and the rays gradually decreasing in height posteriorly.

The anal fin is opposite to the first anal, similar in shape but

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shorter in its base. Caudal large, oval,
nearly as long as the head. The long
faint ventrals reach as far back as
the anal fin. Pectorals large, rounded.

Color pale-greenish. The head
and anterior portion of the body is
ornamented with several sub-vertical
dark margined whitish bands which are
more or less bifurcated beneath. Similar
lined short lines between the snout and
eye. Under golden all the fins trans-
parent, with a very slight greenish tinge
and the rays of the dorsal and caudal
bordered with brownish.

Length $\frac{3}{4}$ inch.

Hab. Society Is.

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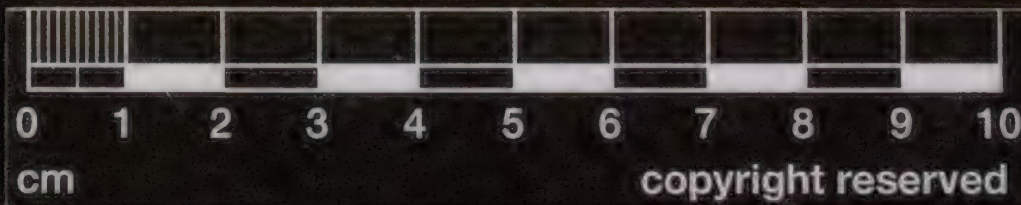


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Gobius semidoliatus

349



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Gobius ornalesimus, Gravell

P. 4; D. 6-15; A. 15-16; V. 5; P. 17; C. 4, 3, 3, 4.

Of this rare and beautiful species we have seen but two examples, which differ slightly in color and markings. Without doubt it should be separated from the typical Gobies, which are fresh water fishes with wide depressed heads.

The general aspect of this fish is elongate oblong, compressed, the ventral outline slightly more arched than the dorsal region, and the greatest depth of the body as compared to the total length is as two to nine. The scales are small, extending anteriorly as far as the interorbital space, deeper than broad in their involution, and the individual scale from the middle of the flange is longer than deep, the posterior margin is subangulate, and ciliated; the upper and lower margins nearly parallel, rectilinear, and the anterior margin undulately convex. Numerous striae radiate from the hinder angle, over the whole length of the scale. A sensible lateral line. The head is sub-circular, the muzzle rounded, and the eyes which approximate the upper line of profile, are circular in shape, their diameter being nearly a fourth the length of the head, and are situated once their own diameter from the end of the upper jaw. The small double nostrils may be seen just in front of the orbits. Cheeks smooth, and the head compressed, the latter comprising nearly a fourth of the fish, caudal fin excluded. Branchial rays not covered by the opercular

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bristles are as near as I could determine
without dissection four in number on each
side. The gill openings are small, their
upper angle is level with the upper part
of the preopercle, and extends a triple distance
thence forward, leaving a broad isthmus between
the two apertures. The mouth is terminal, very
slightly oblique in its moderate gape, and
the slender tip of the maxillary extends
back to a vertical line passing through
the center of the eye. The tongue is large
and fleshy. The lower jaw is armed with
fine, acute teeth, and from eight to ten large
hooked ones anteriorly, and a stout, lateral
curved canine, which is directed outward
and backward. The upper jaw is provided
with similar teeth, without the stout
canine.

The first dorsal fin is opposite to the
a bdominal space, deeper than long, and com-
posed of six, slender, flexible rays, all prolonging
beyond the intermedial membrane, the 2^d and
fourth much so, the latter the longest, which
equals the base of the second dorsal. The first
ray is half as long as the second, which together
with the third are nearly as long as the fourth.
The fifth is a little longer than the first, and
the last is about two-thirds the length of the
latter. The second dorsal is a little removed
from the first, not so deep as the latter, but
much longer on its base which nearly equals
a fourth the length of the fish. Its depth is com-
pared to its length is nearly as one to two. The first
two rays are shorter than the others, which latter
are of nearly equal height throughout. The anal
fin is continuous to the one above, but a triple
shorter anteriorly. The caudal is long and rounded.
The preopercle and opercle are also long.



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The former water can reach posterior as far as the anal fin; the latter when laid back also touch that fin, and are elegantly funnel-shaped.

The upper half of the body and upper third of the head olivaceous yellow, ~~black~~ ~~framed~~ into yellowish white beneath, the former, and into a copious yellow on the sides of the head. The upper half of the body is marked with rather large, irregular, whitish large spots, and girdled by five vertical buff, and irregular, dusky black bands, which are much more numerous than those in the spaces; the first extends beneath the middle third of the first dorsal, the second below the origin of the second dorsal, the third beneath the middle of that fin, the fourth at its hinder termination, and the fifth encircles the caudal trunk. The sides of the head are ornamented with small, dark brown light blue spots, a few of which encircle the anterior part of the body. Pale reticulate lines may be seen on the top of the snout, on small round mammillae red spots on the nape and occipital regions. Sides pale above yellow

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The first dorsal fin is light olivaceous
yellow, the upper anterior margin bordered
with ^{pale yellow} white, and the whole fin marbled
with large diffuse brown irregular spots
and dotted with white. The second dorsal
fin is horizontally banded in the following
manner: a basal one of the same hue as
the back, then one of an olivaceous brown
tint, succeeded by a pale yellow irregular
upper margin with a slender white and black
edging. The upper margin of the fin is bordered
with light brown, and a series of bead-like
white dots between the brown and yellow bands.
The caudal fin is colorless, except a tinge
of yellow on its basal third, and several small
shining brown spots, and sometimes a pale
brown posterior border. The anal fin is
with a submedian horizontal olive brown
band, the lower border light brown and the
base half marked with two series of white
bead-like dots. Pectorals yellow, and the ventrals
whitish with a pale olive tinge.

Length. 4 inches.

Habitat. Loc. etc. Yab.

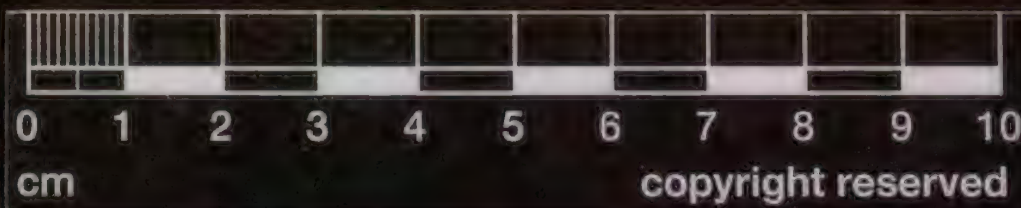
Native name "Ohna".

The three are nearly as long as the fourth,
if the is a little longer than the first, and
not is about two-thirds the length of the
first. The second dorsal is a little removed
from the first, not so deep as the latter, but
is longer in its base, which nearly equals
the length of the fish. Its depth is
its length is nearly as one to two. The first
is shorter than the other, which latter
nearly equal bright blue to the anal.

225

Gobius phalaena

121



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Gobius maculatus, Garrett

D. 6-10; A. 12; V. 8; P. 20; C. 4, 1, 6, 6, 1, 3.

The general form of this Gobius is elongate, sub-fusiform, compressed, tapering posteriorly from the thoracic region. The depth of the body taken at the origin of the anal fin enters just seven times in the total length. Scales well developed. No visibly lateral line. The head, which constitutes about one-fifth of the entire length of the fish is slightly roughened by ridges, sub-conical, the upper and lower outlines being regular continuations of the dorsal and ventral arches, the upper line descending quite precipitately in advance of the eyes. The mouth is large, oblique in its closure, and the pointed extremity of the maxillary reaches a vertical that would pass behind the eye. A single range of slender minute hooked teeth in either jaw, the upper row the larger, which when the mouth is closed pass outside the lower lip. The approximating eyes are horizontally elliptical, inserted even with the upper line of profile, and their greatest diameter enters three and a half times in the length of the head. Nostrils elliptical, placed immediately in front of the eyes.

The first dorsal fin is opposite to the abdominal space, contiguous to the second dorsal, and the rays prolonged into filaments of which the fourth one is the longest. The second dorsal

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is rather deep, its anterior rays very short and the posterior one when bent back reaches the base of the caudal. The anal fin is of the same size and structure as the opposite fin, but is inserted a trifle more posterior. The ventrals are long and lanceolate in shape, and the pectorals, which are well developed reach slightly beyond the origin of the anal fin. The caudal is longer than the head and of a broad lanceolate shape.

The color as near as I can determine from an alcoholic specimen is of a sub-pellucid bluish-gray, spotted with blackish along the upper half, and a short bar beneath the eye. The dorsals are mottled with dusky and the caudal is spotted on its rays. The other fins have a slight dusky shade.

Length 3 inches.

Hab. Society Isls.

This species inhabits fresh water.

cm

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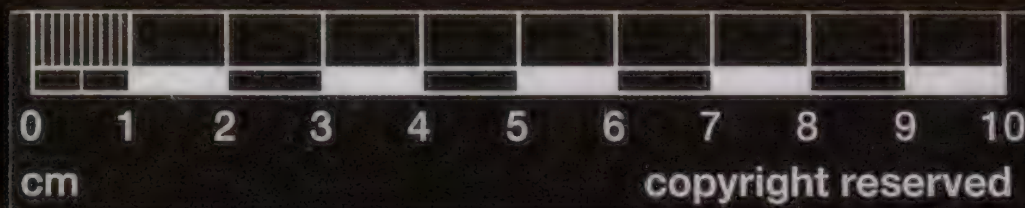
NATURAL
HISTORY
MUSEUM

226



Sobies

125



N NATURAL
HISTORY
MUSEUM

Gobius No 317.

D. 6-7; A. 7; L. 6; P. 3; V. 3, 7, 6, 2.

The head constitutes about two thirds of the total length and is nearly vertical in front of the eyes and wider over than any one, which latter are large, round and even with the upper line of profile. Cheeks smooth. Scales of moderate size. Ventrals near the end of the snout and joined through little fleshy tube.

The two dorsals are separate, of nearly equal height and length, the first composed of six flexible rays, of which the second is the longest and the succeeding ones diminish so rapidly as to give the fin a sub-triangular outline. The soft dorsal and anal are similar, opposite, the latter the smaller and both tapering posteriorly. The caudal is rounded and as long as the head. The pectorals are wide and the ventral pointed.

Color of the upper parts brownish gray becoming pale gray beneath, and bluish beneath the head, breast and belly. Flanks marked with six vertical cloud-like tapering black bars, which in their descent break up into crowded spots. Similar spots on the head. All the fins except the ventral and anal have their rays spotted with blackish. Otherwise the fins are nearly colorless.

Length $\frac{3}{4}$ of an inch.

Hab. Society Isls.
Rare. Marine species.

NATURAL
HISTORY
MUSEUM

2

copyright reserved

cm

Gobius No 318

D. 13; A. 11; V. 5; P. 16; C. 10, 5, 7, 4.

If this species I can give but an imperfect description in consequence of having lost some of my notes made at the time I discovered the species.

Its general shape is elongate, cylindrical, becoming more and more compressed posteriorly, and in profile tapers away from the origin of the first dorsal to the stout trunk of the tail. The head is a little longer than the depth of the body, being not quite a fifth of the whole fish. Its upper line is depressed and the cheeks swollen, and lower outlines are slightly arched over the cheeks swollen. In profile the snout curves suddenly upward and backward so that the muzzle has an obtuse appearance. The scales are of moderate size and extend forward as far as the breast and the nape. The eyes are large, sub-circular approximate the upper line of profile and their diameter equals one-fifth the length of the head. The lower jaw is armed with two remote anterior hooked teeth, and minute ones posteriorly. No teeth observed on the upper jaw. Lips ciliated. ~~with~~ (The two last characteristics confirmation).

For position, size and shape of the fins see the colored drawing, and consult the same for color.

Length 3 inches. Hab. Pacific, Indo.

NATURAL
HISTORY
MUSEUM

2

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0 1 2 3 4 5 6 7 8 9 10 cm



Gobius bipinnatus, Garrett.

D. 6-7; A. 12; P. 6; V. 14; C. 2, 7, 7, 2.

The general aspect of this species is elongate, slightly tapering in its outline either way from the first dorsal fin. The anterior part of the body is subcylindrical, becoming more and more compressed posteriorly. The head, which is flattened above, comprises about two-thirds of the total length, and the large eyes approximate the upper line of profile, their diameter exceeding three times in the length of the head. The snout is prominent, slightly projecting over the mouth, and the upper jaw is the longer. Lips thick and fleshy. The hinder tip of the maxillary extends posteriorly to a vertical passing a little behind the anterior border of the eye. The lower maxillary teeth consist of four anterior stout hooked teeth and those on the upper jaw are very fine and closely-set like those observed in *Blinneus*. The two nostrils approximating. There is no apparent lateral line, and the rather large scales are ciliated, none on the head.

The first dorsal fin commences just behind the base of the pectorals, and is longer than deep. It is composed of six flexible rays, of which the third is slightly the longest, becoming rapidly shorter posteriorly and all prolonged a little beyond their connecting membrane. The soft dorsal commences

NATURAL
HISTORY
MUSEUM

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some distance from the first which is slightly overtopped and tapers away posteriorly.

The anal fin is similar to the fin above, but is placed a trifle more posterior. The ventrals are short, oval and inserted beneath the pectorals, which latter are large and wide. The caudal is rounded.

This species is of a bronze color above which passes into grayish white beneath, and marked with two horizontal dark brownish black more or less mottled bands, one traversing the median line of the body and the upper one intersecting dorsal and interrupted by the eyes, both extending to the end of the snout. All the fins transparent, nearly colorless except the vertical ones which are dotted with blackish brown on their rays. Irides silvery.

Length 1 to 2 inches

Hab. Society Is.

A fresh water species called by the natives *Apiri*.

cm

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NATURAL
HISTORY
MUSEUM

317

227



318

228



319

229

Gobius aff.

NATURAL
HISTORY
MUSEUM



Gobius patacto, Garrett

B. 4-4; D. 6-14; A. 15; V. 6; P. 20; C. 6, 7, 6, 5,

The general aspect of this species is rather slender, elongate and somewhat strongly compressed. The depth taken at the origin of the anal fin enters not quite nine times in the total length. Scales of moderate size. Head scaleless. Lateral line straight, following the median line of the body. The head is sub-conical, the snout obtuse, and as compared to the length of the fish is as one to six. Cheeks swollen. The eyes are inserted high up so that their upper edge is even with the upper line of profile, and only separated by a narrow groove; their horizontal diameter is contained four and a half times in the length of the head. The nostrils are nearer to the eye than to the end of the snout. Mouth large, its gape oblique, the lower jaw slightly the longer, and the tip of the maxillary reaches a vertical drawn through or a trifle behind the center of the eye. The teeth are rather slender, conical, slightly hooked, disposed in a single row on the upper and in two rows on the lower jaw. The fins are all well developed. The first dorsal is higher than long, contiguous to the base of the second fin, the rays prolonged far beyond their membranes, the third one the longest and the posterior one shorter than the first. The second dorsal extends over a bare half the length of the fish excluding the head and caudal fin; its depth exceeds that of the body beneath its own base,

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HISTORY
MUSEUM



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and is

gently arched above. The rays in the second dorsal and anal are more or less bifid, and the posterior ones exhibit a third division. The anal, which is similar to the one above, is much shorter and slightly nearer to the base of the caudal. The ventrals are long, reaching as far as the vent, and inserted immediately behind the base of the pectorals. The pectorals are also long, and reach as far back as the origin of the anal fin. The large caudal is ovate-lanceolate in shape, its length being one-third that of the fish.

Color pale sub-transparent grayish white, with obscure light fawn blotches along the upper half of the body. Small irregular bluish silver spots behind and beneath the eye. Irides yellowish-silver; cornea black. Fins transparent and colorless or whitish, except the dorsals which are striped with pale brownish, the stripes disposed horizontally on the second and oblique on the first dorsal.

Length 4-5 inches.

Hab. Maiav Is., Society Isls.

Common in the brackish water lagoon. Its vernacular name is Pa-ta-to.

cm

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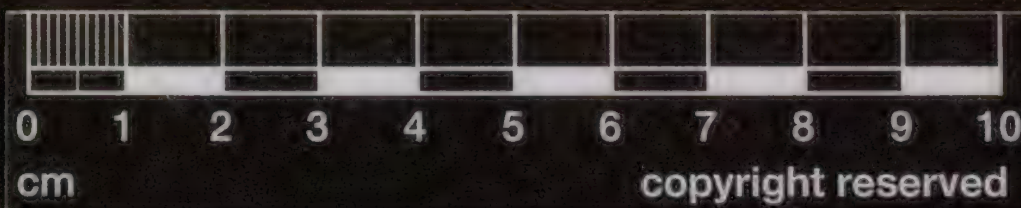
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Sobies

123

230



N NATURAL
HISTORY
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*Ophthalmonema, Blake*Gobius No 127

This species is of an elongate form, rather strongly compressed and tapering away from the head to the tail. The depth of the body above the origin of the anal fin equals one-sixth of the total length, caudal excluded and the thickness at the same point is about half of the above mentioned depth. The head, which comprises a sixth of the total length, is slightly swollen on the cheeks, and the moderately sized eyes approximate each other and are of an oval shape, their diameter extending four times in the length of the head. Their orbits are each furnished with a long simple tentaculiform cirrus. The nostrils are nearer to the eyes than the end of the snout. The very oblique mouth is armed with fine card-like teeth, disposed in a single row in the upper jaw and in a narrow band in the lower one. The preopercular bone is entirely covered with the integument, and the gills are assisted by a broad intermuscular anal papilla is conical. The head is scaly, then on the body are of moderate size, and there is an obscure lateral line.

D. 5; A. 6-13; V. 14; P. 21; C. 3, 4, 3.

The first dorsal corresponds to the abdominal space, and is composed of 6 flexible rays, five of which are produced into little filaments. It is deeper than long and approximate to the soft dorsal. The latter fin is large, the rays gradually increasing in height

NATURAL
HISTORY
MUSEUM

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from the first to the twelfth, which latter is nearly twice the height of the first. The last ray is double and reaches far behind the base of the caudal fin. The anal fin is quite similar to the soft dorsal, except the middle rays being the longest, and it is placed a little nearer to the base of the caudal fin. The large ventrals do not quite reach the vent. The pectorals are broad lanceolate, and extend back as far as the third or fourth anal ray. The caudal is shaped like the pectorals and is longer than the second dorsal fin.

Color pale olive-green, white beneath, and the top of the caudal trunk is black. Ventrals cupped with brown shades. Gills reddish. The two dorsals are pale translucent, the first with obscure creamy white lines on the upper half, and all the other fins with a slight dusky shade.

Length 5 inches

Hab. - Soviet Union

Inhabits fresh water Rivers

cm

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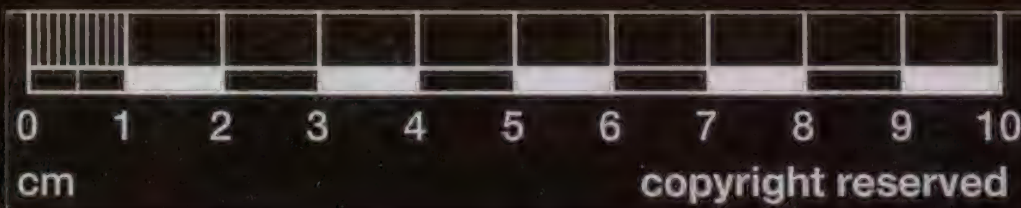
NATURAL
HISTORY
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231



Ectenogobius ophthalmoneuma

127



N NATURAL
HISTORY
MUSEUM

Pezomachus abbotianus, Stead

No 462

This singular fish inhabits the fresh water streams at the Sandwich Islands, where it seems to be very rare from the fact of our having seen only two examples.

It evidently belongs to the same genus as No 351.

The color dusky olive above, which color is confined to the upper third of the fish. A white band extend from the end of the snout straight to the caudal fin. Beneath the band the ground color is olive passing into grey beneath the belly. On the olive ground may be seen a longitudinal row of blackish spots, which do not extend in advance of the pectorals. Sides reddish brown. Ventrals olive, reddish in front. All the other fins blackish, the second dorsal, caudal and anal margined with blue, and the latter fin is dotted with the same color on the basal half.

D. 6-8; A. 1; V. 2; P. 2; C. 2.

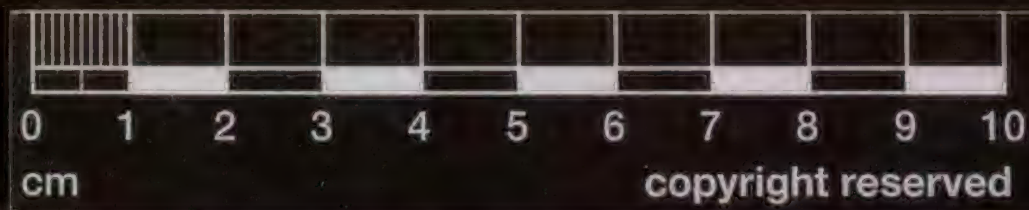
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NATURAL
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Gobius? No 351

D. 6-12; A. 11; P. 5; V. 16; L. 3, 7, 7, 2.

The general aspect of this singular species is elongate oblong, sub-cylindrical anteriorly gradually becoming coniform posteriorly and much so at the caudal trunk. The dorsal line is nearly horizontal, the abdomen arched and the depth at the origin of the anal fin is one-seventh the total length; the greatest thickness which is at the base of the head equals the above mentioned depth. The head comprises two-thirtieth of the whole fish. Cheeks smooth and swollen. Eyes small, high up on the line of profile, and inserted a little more than their own diameter from the end of the snout; they are sub-circular in shape, their diameter entering about four times in the length of the head, and separated by a space nearly equaling two diameters. The nasal opening slightly nearer to the end of the snout than the eyes. The snout is prominent, roundly projecting in advance of the jaws. The mouth is small, the maxillary extending a little behind the anterior limit of the orbit. The upper jaw is armed with a single crowded range of very fine teeth like a Blinney, and the lower jaw furnished with four or five remote caniniform teeth. The gill fissures equaling in length the base of the pectorals. No visible lateral line. Scales of moderate size, young, ciliated, none on the head or breast.

NATURAL
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The first dorsal fin corresponds to the middle of the distance between the ventral and anal fin. It is nearly as deep as long, the third and fourth rays prolonged into filaments. The second dorsal is situated one diameter of the eye back of the first fin and extends over one-fourth the total length of the fish. It slightly overlaps the first dorsal, tapers away posteriorly and the last rays reach the base of the caudal when laid back.

The anal fin is opposite, not so deep and shorter on its base than the fin above. The united ventrals form a low rounded disk. The large pectorals are also expanded rounded. Caudal rounded the rays bifid.

Color blue-black, blue beneath the head and the abdomen bluish silver. Irides blue black. Anal black. Ventrals orange red margined above and below with light green and blue black, the latter intra-marginal. The dorsals are black, the pectorals blue-black and the ventrals black centrally.

Length $2\frac{1}{2}$ inches.

Hab. Society Is.

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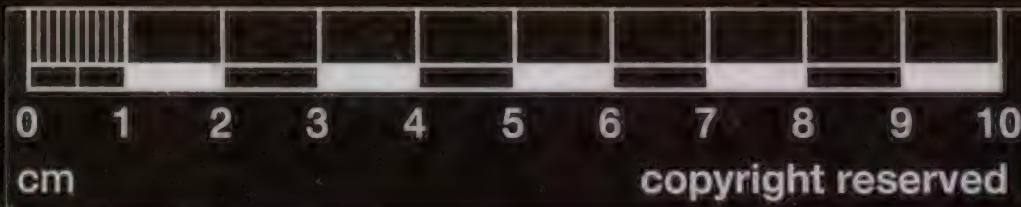
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HISTORY
MUSEUM

233



Sicydium

357



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N NATURAL
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Genus Eleopsis, Garrett

Form oblong, compressed; scales covering the body and extending over the head as far as the snout. No visible lateral line. Head well developed, rather obtuse. Mouth small, oblique. Teeth minute. Preopercular margin free and armed with two or three spines. Eyes approximating above. Anterior nostril pierced through little fleshy tube. Fins rather large. The first dorsal fin, which corresponds to the abdominal space, is composed of six slender flexible rays. The second dorsal and anal are opposite, similar, and longer than deep. Caudal rounded. Ventrals large, inserted under the pectorals, which latter are also large and rounded.

Eleopsis punctatus, Garrett

D. 6-12; A. 11; V. 6; P. 16; C. 4, 1, 6, 5, 1, 3.

Both dorsal and ventral outlines are gently arched. The head comprises nearly a fourth of the total length. The eyes are subcircular, their greatest diameter about three and a half times the length of the head, and their orbits rises above the upper line of profile. The first dorsal fin is deeper than long; the second ray is a little higher than the first, and the third which is the longest, is prolonged above the membrane. The three posterior rays rapidly decrease in altitude. The second dorsal is lower than the first, convex above, and the similar shaped

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HISTORY
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shaped anal is smaller than the fin above. The ventral rays increase in length posteriorly, and when laid back their tips reach the origin of the anal fin. All the articulating rays are bifid.

Color: upper half pale greenish, and the lower portion pale-gray, and punctured with blue. The upper half of the body is ornamented with six or seven cloud-like vertical brown bars, and small spots of the same color marks the head. There is most generally a longitudinal row of irregular yellow spots behind the pectorals. Sides greenish-silver. Fins all colorless except a faint brownish shade on the dorsal, and two rows of blue points mark the basal half of the anal.

Length 1 inch.

Hab. Society Is.

cm

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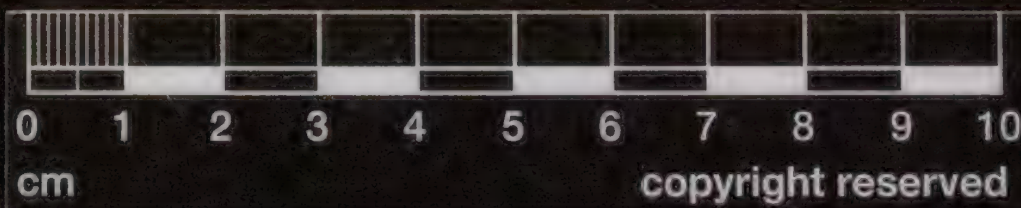
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NATURAL
HISTORY
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Eleotris semipunctata
Eleotris cyanostigma

234
325



N NATURAL
HISTORY
MUSEUM

Eleotris serialis, Garrett

D. 4; A. 6-7; St. 10; P. 6; V. 3; C. 3, 1, 4, 1, 2.

Form oblong, rather strongly compressed. The greatest depth taken at the origin of the first dorsal is about one-fourth the total length, or equal to the length of the head. The eyes are circular, their diameter entering about four times in the length of head, and the interocular space is concave. The posterior nasal aperture is close to the orbit, and the anterior which is pierced through a tube is near the outer upper lip. The preopercle is armed by three stout spines. Mouth oblique. Lips fleshy. Scales rather large; muzzle naked. No visible lateral line. Teeth sharp, conical, few in the lower jaw, and a closely set series in the upper one.

The first dorsal is deeper than long. The third ray considerably prolonged into a filament. The second dorsal approximates the first, very large, the rays much divided and gradually increased in height from the first to the eighth and the last one double. The large anal fin is shaped much like the soft dorsal but shorter in its base, and more removed from the caudal fin. The large oral pectorals reach posterior to the origin of the anal fin. The ventrals when laid back reach anal fin. The rather long caudal is rounded.

Color pale grayish on the flanks, pale greenish above mottled with diffuse brown spots disappearing in three longitudinal rows on the body and a single large one on the opercular bones.

NATURAL
HISTORY
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dusky brown band descended from the eye.
The body is marked by four horizontal
rows of dark margined blue dots, and sim-
ilar ones scattered over the side of the
head. Ventrals greenish slate. Fins mainly
colorless except a bluish slate cloud on the
basal portion of the first dorsal, and the
other vertical fins dotted with light blue
between the rays.

Length 2 inches

Habitat. Society Isls

We have separated this from
the typical *Eliothis* under the new genus
Eliopsis.

cm

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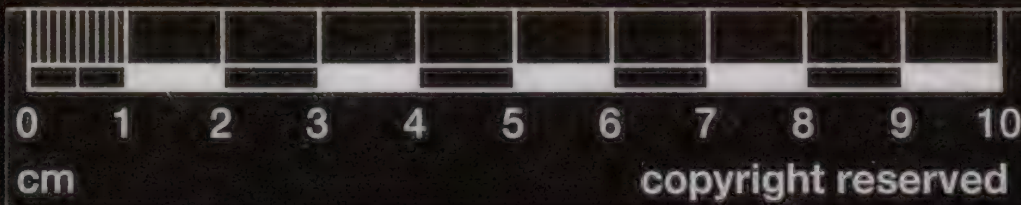
NATURAL
HISTORY
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233



Eleotris semipunctata
Eleotris cyanostigma

346



NATURAL
HISTORY
MUSEUM

Genus Dolipitera, Garrett

Form elongate oblong, compressed. scales well developed, extending over the head as far as the eyes. The trunk of the caudal is nearly as long as the body. Head large, oblong, sub-conical. Nostrils inserted near the end of the snout, and pierced through little fleshy tubercles. Mouth small, oblique; lower jaw the longer and both furnished with bands of villiform teeth. The two dorsals are very high, remote, and the first which is composed of six flexible rays, is situated above the pectorals. The second dorsal and anal are much deeper than long, opposite, similar in form, and both have their extremities pointed. Caudal rounded. Ventrals elongate, and inserted in advance of the pectorals, which latter are broad ovate.

This genus may be distinguished by its long head, short body, long caudal trunk and high fins.

Dolipitera cincta, Garrett.

D. 6/7; A. 7; V. 6; P. 16?

The head, body, and caudal trunk of nearly equal length. The former is depressed above, and slightly wider than deep. The eyes are circular, situated near the snout, and their orbits arise a trifle above the upper line of profile. The dorsal line between the two fins is slightly concave.

NATURAL
HISTORY
MUSEUM

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The third ray in the first dorsal is the tallest, and not the fourth as represented in the figure. The soft dorsal, which is much higher than the first, is acutely angular above. The pectorals reach posteriorly a little beyond the origin of the second dorsal. The ventral rays increase in length from the first to the last, and project considerably beyond the anal fin.

Color gray. Sides with six vertical deep brown bars, which are wider than their interspaces. The first crosses the base of the head, then on the flanks of the body, and two on the caudal trunk. Scales margined with orange, and the head spotted with the same color. Sides light orange-red. Pectorals colorless. All the other fins more or less brown. The soft dorsal and anal tipped with reddish.

Length $1\frac{1}{4}$ inch

Hab. Society Isls.

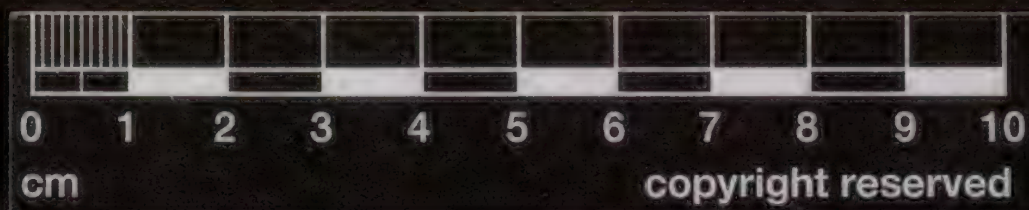
A very rare fish found in
Gilaia water.

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Electris No 345

B. 6; D. 6-7; A. 7; V. 6; P. 14; C. 6, 7, 4, 5.

At the base of the head the thickness and depth are equal, the body becoming considerably compressed posteriorly and slightly taper in outline, which exhibits a slight concave depression between the two dorsals. The height of the body over the ventrals equals about one-fifth of the total length, though some are more slender than others. The head, which comprises about a third of the fish, caudal excluded, is slightly concave over the eyes, which latter are contiguous to the upper profile, sub-oval in shape, their length one-fifth as long as the head.

The first dorsal fin commences just midway between the end of the snout and the base of the caudal fin. It is longer than deep, the last or shortest ray remote from the others, and the upper margin is obliquely arched. The soft dorsal is a little deeper and longer than the first fin, convex above, slightly increasing in depth posteriorly, where its height equals its own length. The anal fin which is smaller and more arched than the soft dorsal, terminates with that fin. The length of the ventrals are equal to the base of the soft dorsal. The expanded pectorals are rounded, and the large caudal is somewhat roundly-ovate, and about the same length as the head.

NATURAL
HISTORY
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The living fish is brownish-black
or black, some times blackish-olive,
and lead color beneath the belly.
The flanks are most generally marked
by obscure horizontal broken lines
and small spots of the a deeper
black. Some times the broken lines
are interrupted by whitish dots.
Ventrals brown. Ventrals pale, with a more
or less dusky line, the dorsals with
obscure wavy dusky markings.

Length 6 inches.

Habitat Society Isls.

Inhabits the fresh water streams.
Native name "O-o-pu".

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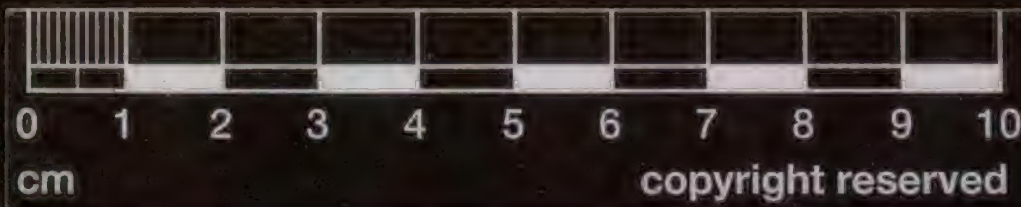
NATURAL
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Eleotris fusca

237

345

F. L. L.



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Genus Bendoelectris, Garret

Body elongate oblong, compressed, scales small, ciliated. Head scutellum, sub conical, obtuse, with the oblique lips lower and fleshy. Mouth cavity slender and slightly hooked. Only the lower margin of the preopercle free, no visible lateral line, anal appendage small. Branchiostegial rays four. Dorsal larger, the two dorsals contiguous at their bases, the first opposite to the abdominal space, consists of slender flexible rays which are drawn out into filaments. Soft dorsal anal long, similar in shape. Ventrals rounded. Pectorals small.

Bendoelectris elegans, Garret

126

B. 4; D. 6-14; A. 15; P. 15; R. 22; V. 7, 7, 6, 6.

The upper and lower profiles are gently arched from the end of the snout to the tail. The greatest depth of the body is about one-sixth of the total length of which the head comprises nearly a fifth. The eyes are circular, their diameter entering five times in the length of the head. The anterior nasal aperture is rather nearer the eye than the end of the snout. The hinder tip of the maxillary extends slightly posterior to the anterior border of the orbit. The teeth are disposed in a single range, the upper anterior the larger, and an anterior hooked canine on each branch of the lower jaw.

The first dorsal fin is longer than deep, its length equalling one-fifth of

NATURAL
HISTORY
MUSEUM

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the total length of the fish, caudal fin excluded. All the rays except the first are prolonged into filaments, the first very long, the others rapidly graduated in their length, so that the last is no more than one-fifth as long as the first.

The soft dorsal, which slightly tapers away posteriorly, is nearly three times longer than its depth, which former comprises about a third of the fish, caudal excluded. It is lower than the first dorsal and commences about midway between the eyes and the base of the caudal fin.

The anal fin though similar to the fin above is a trifle shorter in its base.

The ventrals are inserted immediately behind the base of the pectorals, pointed, and when laid back do not reach the anal fin by half their own length.

The pectorals are a little shorter than the ventrals, and the large caudal fin is as long as the head.

The upper third of the head and body is pale slate green, becoming paler beneath, and a few fine vertical short dark lines just behind the pectorals. The middle third of the head and body as far as the tip of the pectorals, thence yellow, the former bluish-white beneath. A narrow ribbon curving upward and backward from the hinder angle of the mouth, terminating on the opercular corner, one on the base of the pectorals, two or three abbreviated ones on the gill covers and a few spots behind the eyes, light blue with dark margins, sides

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light green. The first dorsal rays are light amber, the filaments rose-red, and the membrane is marked with a few rose-red stripes, which curve obliquely upward and backward from the base of the fin, and seem to be a continuation of similar markings on the soft dorsal, which are arranged alternately with light chrome-yellow band all curving upward and backward. The caudal fin is decorated with two wide rose-red bands edged with light blue and disposed parallel to the rays, and a chrome-yellow tinge on the base, otherwise the fin is colorless. The anal fin is nearly colorless except a slight pinky-red marginal and basal line. The other fins are nearly colorless.

Length 5 1/2 inches.

Hab. Society Isls.

Very rare.

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MUSEUM

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cm

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238

Eleotris stizata

126

Eleotris stizata (Cuv. & Val.)

g. 126



Eleotris stizata (Cuv. & Val.)



NATURAL HISTORY MUSEUM

Aspidontus taeniatus, Cuvier.

Aspidontus taeniatus, Cuv. Zool. Voy. Antarctique
Vol. 1, p. 211, pl. 19, fig. 4.

D. 39; A. 26; P. 15; V. 2, 6, 5, 1, 12.

The upper line rises with a gentle curve from the snout to a point over the pectorals whence it gradually descends to the caudal fin. The head enters about five times in the total length of the fish. Eyes large, circular, approximating the upper line of profile, and their diameter equals one-fourth the length of the head.

The dorsal fin arises just back of the eyes and almost immediately tapers posteriorly. The anal is half as long as the dorsal and gently arched beneath. The length of the pectorals equals one-third the length of the anal base.

Color light blue becoming a fine rich blue posteriorly. A dark black band starts from the snout, cutting the eye, and gradually becoming broader as it runs to the caudal fin, where it leaves only a narrow streak of the ground color above and beneath. Ventrals dusky. Dorsal fin deep black, with the upper margin of its posterior half white. Anal fin blue-black, with its lower margin white. Pectorals and ventrals colorless. Caudal deep black, margined above and beneath with rich blue.

Length 4 to 5 inches.

Hab. Panama Is. to the Viti Is.

Native name at Tahiti: *A-ti-pu-ta*.



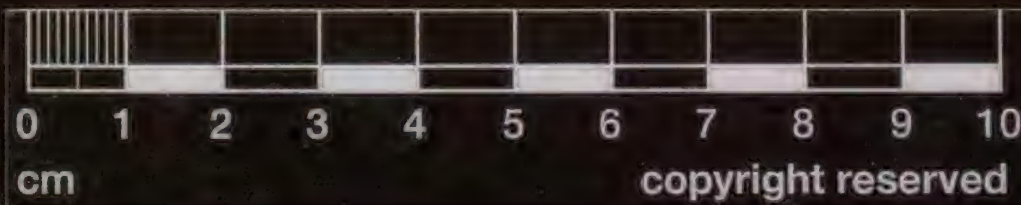
Petrosciartes taeniatus
T. A. S. L.



239

Petrosciartes taeniatus

329



N NATURAL
HISTORY
MUSEUM

D. 39; A. 28; P. 3; V. 15; C. 3, 5, 8, 3.

Form elongate, compressed, scales and without any visible lateral line. The body gradually tapers posteriorly from the base of the head, and in depth equals about one-seventh of the total length of the fish. The head which comprises a little more than one-fifth of the total length, is conical in shape and the snout projects in advance of the lower jaw. The latter is truncate in front, each angle armed with a large strongly hooked canine, and the space between the two fangs furnished with 16 to 17 closely set compressed teeth. The upper maxillary teeth are similar to those beneath, but more irregular and the canines are small. The circular eye is nearly even with the upper line of profile, distant once its diameter from the end of the snout.

NATURAL
HISTORY
MUSEUM

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The dorsal fin commences a little posterior to the hinder margin of the eye, and extends close to the base of the caudal fin. Its anterior portion which equals the length of the head in altitude, is triangular in shape. The remainder of the fin in height equals half the depth of the body. The rays, as well as those of all the other fins are flexible and undivided. The anal fin, which is rather deeper than that portion of the dorsal above, takes its origin just midway between the end of the snout and the base of the caudal. The ventrals are small and inconspicuous. The pectorals are ovate and the caudal truncate.

Color light blue above, bluish silver beneath, the former color mottled with dusky. A blackish band commences at the end of the snout, passes through the eye, gradually increasing in width and

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Pectoral

Habit

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becoming paler posteriorly. Irides
soiled yellow. Dorsal fin dilute white,
and nearly covered with large diffuse
dusky spots. Anal dusky with the
upper and lower margins white.
Anal dusky blue, more or less clouded
with whitish. Ventrals bluish green.
Pectorals colorless.

Length 62 Mill.

Habitat. — Haikow So.

NATURAL
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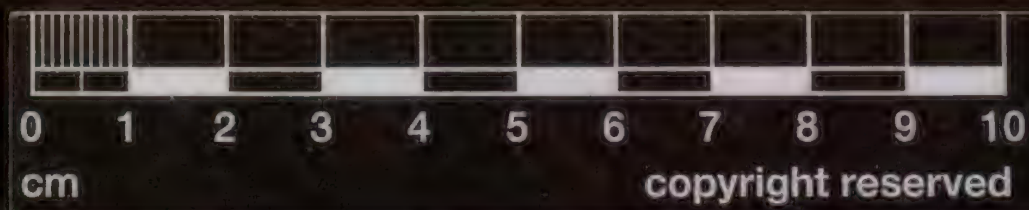


240

1



Petrosaurus filamentous



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MUSEUM

No 327

Gen. Char. Body elongate, compressed, smooth, scaly. Head compressed, obtuse, pointed in front. Mouth small situated low down; jaws armed with a single close range of exceedingly fine slender teeth and two posterior canines. Gill apertures short. No visible lateral line. The dorsal and anal fin united to the rounded caudal, the latter serrated beneath. Pectorals rounded. Ventrals composed of two rays and situated under the throat. All the fin rays undivided.

Spec. Char. L. 30; A. 19; V. 2; P. 15; C. 13.

The body gradually tapers away from the head. The eyes are large, circular, touching the upper line of profile. The dorsal fin commences a little in advance of the opercular corner and gradually increases in altitude posteriorly. The anal fin takes its origin about midway between the end of the snout and the tip of the tail. It is not quite so deep as the dorsal and is convex along its lower margin.

Color uniform blackish, some darker than others, sometimes greenish posteriorly. Ventrals dusky red. Pectorals colorless.

Length 1 1/4 inches.

Hab. Society Isls.

Common in clumps of coral.

NATURAL
HISTORY
MUSEUM



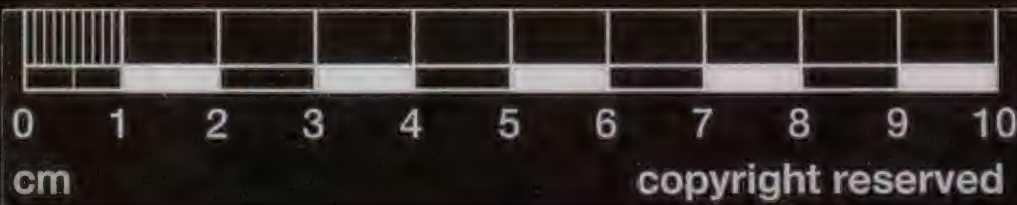


241

Petrosites
ater
100, F. M. S.

Petrosites ater

327



NATURAL HISTORY MUSEUM

238; d. 27; l. 3; p. 11; c. 45; 51

This species is shaped very much like the preceding one, but the dorsal fin commences more posterior, and the anterior portion is not triangular, but gradually tapers posteriorly.

The upper half is pale brownish, the lower parts silvery gray with a red and a golden yellow tinge on the abdominal region. The flanks are marked with 8 vertical dusky bars which are wider than their interspaces and deeper colored on the upper half of the fish. An obsolete tapering dusky band extends from the end of the snout to the gill openings. Irides golden yellow. Dorsal fin pale yellowish with oblique vertical dusky bars corresponding to those on the flanks. Anal dusky. All the other fins

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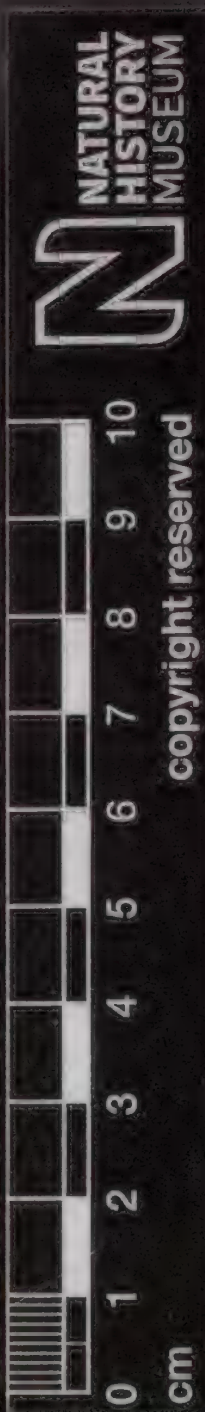
cm



colorless.

Length 43 Mm.

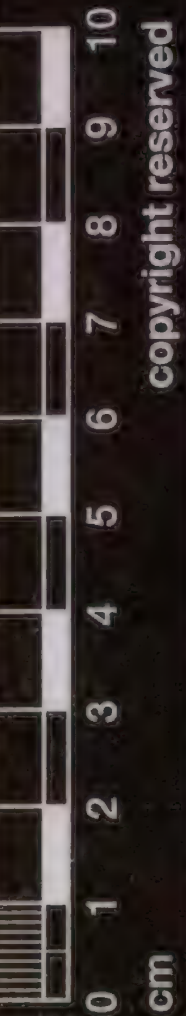
Habitat. Hun-hu Id.



Petioscirtus

242

2



NATURAL
HISTORY
MUSEUM



Blinnius elongatus, Garrett

D. 14-22; A. 20; P. 2; V. 12.

This species is elongate, slender, the depth taken at the vent anterior nine times in the total length. The abdominal region in the two specimens before is considerably swollen. The head comprises nearly a seventh of the entire length, and the cheeks are turgid. The eye is circular, its orbit rising high above the upper line of profile, which latter is precipitately convex in front and rounded above. A small fimbriated circle on the upper posterior part of the orbit. Nostrils simple. A series of pores marks the lower and hinder limit of the orbit. The upper lip is very large and bulky, projecting over the lower one.

The two dorsals differ but little in height and length and are united at their bases. They are very low as compared to other Polynesian species, the first gradually tapering posteriorly from the first ray, and the second is convex along its upper margin.

The anal fin is much longer than the soft dorsal and about the same shape and depth as that fin.

Color light bluish slate, the body with whitish vertical cloud-like bars. Abdomen and lower part of head bluish gray. The dorsals are canaliculate bluish-slate, the former with colorless upper margins and the anterior one tinged with reddish. The pectoral

anal ventral with a dusky tinge
The anal nearly cylindrical and marked
with a single horizontal row of dusky
dots.

Length 4 1/2 inches

Hab. - Society

A very rare specimen

cm

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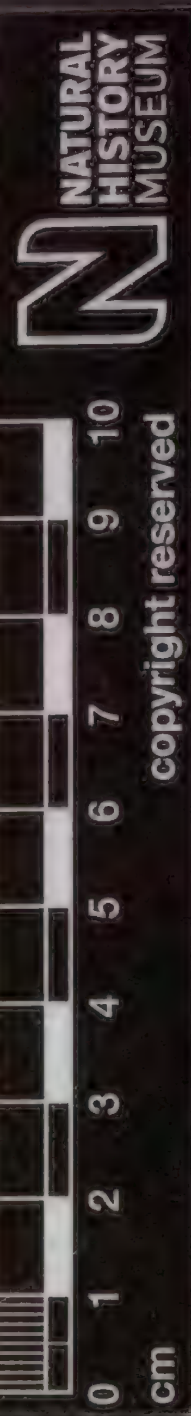
NATURAL
HISTORY
MUSEUM

Blinners, No. 332

B. 6; D. 10-14; A. 17, 18; P. 15; V. 1, 2, 3, 4, 5.

This small species is of an elongated form, rather stout, the length of the head equal to the depth of the body and the vent, or as compared to the total length 2 to 5. The cheeks are much swollen and the anterior portion of the head is obtuse, nearly vertical and rounded above. The eyes are nearly circular, inserted high up on the head even with the upper preopercle, and their greatest diameter equals one-third the length of the head. The nostrils with a small bifurcate tentacle. The lower jaw is armed with two hooked posterior canines. The body is considerably compressed, and the dorsal region is slightly arched.

The dorsal fin is very deep, nearly equally divided in its two portions, and the anterior part gradually decreases in altitude from the first to the last ray, still preserving a slightly convex upper margin. The last ray which is less than half as tall as the first, is united by membrane to the succeeding articulated ray. The soft portion is fully as high as the anterior fin, but does not taper away nearly so rapidly, and the last ray which is only half as tall as the preceding one is joined by membrane to the caudal fin. The upper margin is slightly convex. The anal fin is as long as its base, but not so deep as the fin above, and is inserted more anteriorly.



Cyprin somewhat variable, generally dusky brown with darker cloud-like bars along the flanks, and paler on the lower parts. The head is ornamented with oblique irregularly disposed dashes of vermilion red. Ventrals yellowish. The dorsal fin like the same color as the dorsal region, the upper portion of the first fin reddish, and sometimes there is a horizontal basal row of vermilion red dots and a second row on the second fin. The caudal is dusky brown with the upper posterior portion reddish. The anal is bluish slate or blue black, either plain or decorated with two horizontal rows of red bands.

Length 2 to 3 inches

Habitat. Society Isls. (Hare)

cm

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B. 6; D. 13-21; A. 24; V. 2; P. 14; C. 3, 1, 2, 4, 5, 4.

Body elongate, compressed, the depth at the vent is ten seven times in the total length. The head which is set back in front, falls a little short of a sixth of the whole length of the fish. The eyes are subcircular, placed even with the rounded upper line of profile. Cheeks swollen. Ventrals bifid, and a simple one on the upper edge of the orbit. The occipital region with a large cutaneous crest. The lower jaw armed with two posterior hook canines teeth.

The dorsal fins are united, and the first which is much the shorter and lower than the second is arched above, the third ray the longest, and the last which is very short is united to the body membrane to the succeeding articulated ray. The second dorsal, which tapers away posteriorly is united by membrane to the caudal base. The anal fin commencing a trifle in advance of the soft dorsal, is of the same length on its base, but not so deep as that fin.

Color silvery gray with several diffuse sub-quadrate darker spots along the middle of the posterior half of the body, which portion is studded with brownish bluish silver dots. The upper third of the body is traversed by two longitudinal light brown lines, and three additional ones which abrupt by termination above the origin of the anal fin. The head is decorated with yellowish brown spots, and a green one on each

NATURAL HISTORY MUSEUM



The opercle region and a dash of the same color beneath the eye, combined disk. Peripetal crest margined with purple. Irides silvery, punctured with light brown. Dorsals transparent, tinged with violet, and margined above with the same hue. The first fin is lined with longitudinal sap green stripes, clouded with dusky, and the upper anterior portion punctured with black. The lower half of the soft dorsal is, like the first fin, lined with sap green, and the upper half with yellow. The caudal rays are spotted with sap green, other colorless except a shade of dusky green along the lower margin.

Length two to three inches

Hab. Society Isls. (Rare)

cm

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Salarias tridactylus



Salarias tridactylus
from Ceylon



? *Salarias sebae*

332

244



Salarias sp.

245

NATURAL
HISTORY
MUSEUM

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Blennius elegans, Garrett.

S. 5; D. 12-21; A. 24; V. 2; P. 14; C. 8, 5, 4, 7.

The depth of the body at the origin of the anal fin is nearly one-seventh of the total length. The head, which is vertical in front, constitutes about one-sixth of the fish. A slightly elevated crest may be observed on the occipital region, and a filamentous tentacle on each orbit. Dilated appendages may also be seen on the nasal regions.

The dorsal fin commences nearly midway between the eyes and the base of the pectorals. Its anterior portion, which is nearly divided into two parts by a deep emargination in the membrane of the fourth ray, is just one-third of the entire length of the fish, caudal excluded. All the rays anterior to the fourth have also their membranes deeply emarginate, but much less so than the fourth. All the posterior rays are filled to their tips with membranes, the last one being not more than one-third as tall as the first articulate ray. The posterior ^{portion} of the dorsal is much deeper than the anterior, from which it is separated by a deep emargination. The anal fin takes its origin opposite to the eleventh

NATURAL
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Dorsal ray, and extends over a base not quite one half the length of the fish, excluding the caudal. The caudal equals the head in length.

Color: the dorsal region is olivaceous yellow, passing into bluish white on the flanks. The upper half of the head and body are mottled and irregularly spotted with fawn color. The middle third of the body is ornamented with several, large, sub-quadrate fawn-yellow spots, each one of which has its lower part prolonged downwards in violaceous bifurcation. Each spot is also marked with three or four small, oblong, light blue spots with narrow black margins. Two or three similar spots may be seen beneath each eye. The dorsal is mottled and clouded with purple along its basal half, dotted with the same above, which are also mixed with vermillion ones. Its upper margin is fawn-yellow. The anal is shaded off with blue-black along its lower margin. The other fins are colorless.

Length, $5\frac{1}{2}$ inches.

Habitat. Society Isls.

Vernacular name, "Ohua"

Remarks. A single specimen of this elegant fish was procured at the above location.

NATURAL
HISTORY
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Blennius interruptus, Garrett

D. 14-21; A. 23; V. 2; P. 13; C. 5, 5, 4, 4.

Of this *Blennius*, I cannot give a detailed description in consequence of the specimens having been sent away before I could note its specific character. The colored drawing will give a good idea of its general shape.

Its color, as copied from my notebook, is greenish lead-color, passing into yellowish fawn posteriorly, and whitish on the belly. The sides of the body are marked with several longitudinal, silvery-white, (more or less interrupted), stripes. The trunk of the caudal is punctured with brown. There is most generally some round deep lead colored or blackish spots on the back. The dorsal is light brown, ornamented with curved oblique greenish-yellow stripes, and the hinder portion is margined above with deeper brown, which fades, becoming dusky towards the lower margin. The caudal has greenish yellow membrane and brown rays. Petiole and ventals nearly colorless.

Length, 4 inch.

Habitat.—Kingmill Is.

Remarks.—Common.

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Salarias ^{*gibbifrons*, A. S.}
~~*godoffroyi*, Stead~~

117
243

Blennius reticulatus, Garrett.

D. 12-20; A. 21; V. 2; P. 14; C. 3, 5, 4, 3.

The head, as compared to the entire length of the fish, is as two to eleven. The forehead projects in advance of the snout. The eyes are circular, their diameter equalling one-third the length of the head.

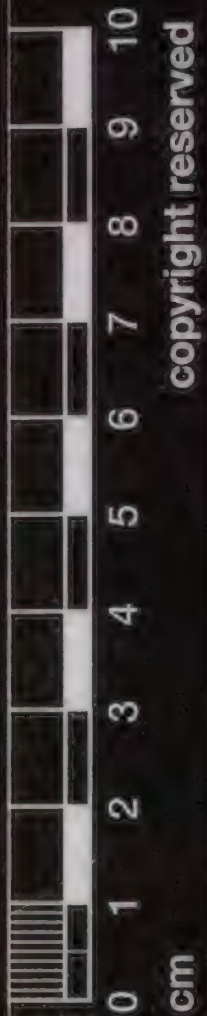
There is a deep emargination between the spiny and soft portion of the dorsal, both of which are gently arched above, and the latter is the deepest. The anal commences opposite the origin of the second dorsal, and equals that fin in depth.

The ground color is light silvery green, passing into bluish-white beneath. The upper half of the body is vertically fasciated with brown, over which, together with the head is thrown a network of vermillion. The flanks are also reticulated with sap-green, and marked by a longitudinal series of oblong vertical sub-quadrate sap-green spots with brown centers. Brown reticulations may be seen behind the pectorals and dots of the same color in advance of those fins. The sides of the head are dotted with brown, white and vermillion. Ventrals silvery, varied with brown. The spiny dorsal is marked with three longitu-

NATURAL
HISTORY
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linal, slightly undulating light reddish bands, which sometimes run into each other, and most generally their interspaces are marbled with pale yellow spots. The upper anterior portion of the fin is also ornamented with a cluster of deep brown or black points. The soft dorsal and caudal are whitish and their rays articulated with small yellowish and black spots. Anal whitish along its base, becoming yellowish outwardly, and traversed throughout its length by two cloud-like obscure bands, of a dusky color. Ventrals pale livid. Brown dots may be seen in the basal half of the pectorals.

Length, 4 inches.

Habitat. Sandwich Isls.

Remarks. I obtained several specimens of this beautiful fish at the above location. Its projecting forehead and vomerian articulation will at once determine it from any of the other species inhabiting the same seas.

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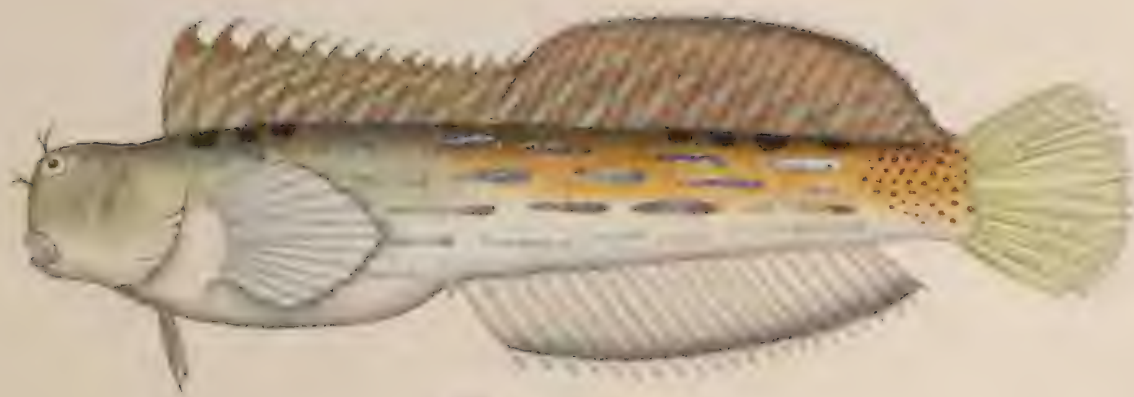


Salarias periophthalmus



115

246



Salarias

116

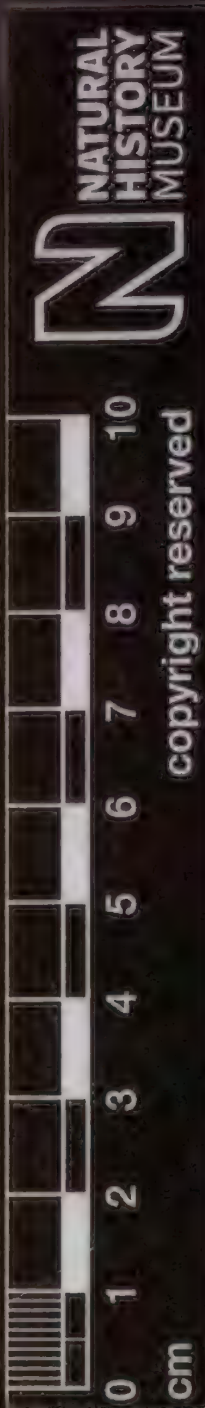
247



Salarias gibbifrons

117

248



Blennius olivaceus, Garrett.

D. 13-21; A. 23; V. 2; P. 14; C. 2, 1, 3, 4, 1, 3.

The depth, taken at the origin of the anal fin, enters six times in the total length. The head, which is vertically convex in front, comprises two-eleventh of the entire length of the fish. The eyes are obliquely oval, their greatest diameter being one-fourth the length of the head. Orbital and nasal tentacles, filiform, the latter bifid. Occipital region with a cutaneous flap or crest.

The structure of the fins differs but little from the preceding species, with the exception of the anal commencing a triple in advance of the opposite fin.

Color olive green, varying in depth of color, and generally pale olivaceous beneath. The body is varied with irregular vertically disposed linear stripes, of a greenish-yellow hue, the stripes simple or bifurcated. Sometimes dots of the same color may be seen along the dorsal region. The head is varied with irregular disposed dots and lines of the same hue as those on the body. Just behind each eye are two vermilion, and two light blue vertical, abbreviated lines, alternately disposed. Dorsals rather deeper

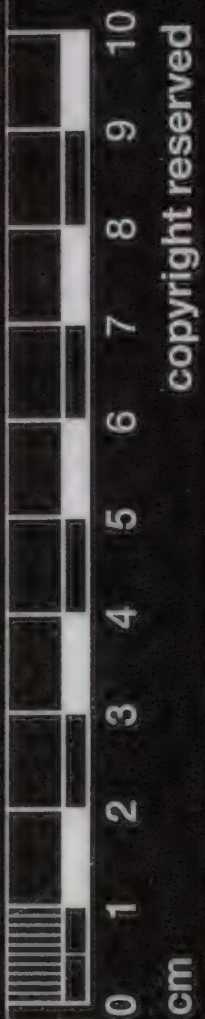
colored than the body; the first fin with
four, longitudinal, ~~more~~ or less broken lines
of a pale yellow color, and the second one
with numerous, but finer lines, which are
also more or less broken and curving obliq-
uely upward and backward. The anal
becomes gradually blackish toward its
lower margin, where the rays are tipped
with rich blue, and most generally there
are two longitudinal thread-like lines
of the same color. The other fins are nearly
colorless.

Length, from 3 to 4 inches.

Habitat.—Society Isls. Panmotu Is.

Remarks.—This is the most abundant
species observed at the above locations. Its
occipital crest, and more or less bifurcated
lines on the body, will determine it.

NATURAL
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Blennius punctatus, garrett.

D. 13-21; A. 25; V. 2; P. 14; C. 4, 1, 5, 4, 1, 3.

The depth of the body at the origin of the anal fin, and the length of the head are about equal or a little more than one-sixth of the total length of the fish. The front of the head is vertically convex. Eyes circular, their diameter a trifle less than one-third the length of the head.

The summit of each orbit and nostril with a simple filiform tentacle. No canines.

The two dorsals are convex above, ^{the} posterior the deepest and much the longest; the two fins are separated by a profound emargination. The anal takes its origin opposite to the union of the two dorsals, being shorter and not so deep as the soft fin above.

The caudal fin is as long as the head.

Color greenish, with silvery green shades, or deeper clouds. Lower part of the head and belly lead-color. Emerald-green semicircular markings on the top of the head and in some specimens red markings of the same character ornament the sides of the head. The greenish ground of the body is dotted with reddish-brown. All the fins have a slight greenish

NATURAL
HISTORY
MUSEUM

Brage and all except the ventral more
or less dotted like the body.

Length, from 3 to 4 inches.

Habitat.—Society Isls.

Remarks.—In general outline
this species is very much shaped like
B. olivaceus, *stobis*, but has no occipital
crest and differs in its markings. It is
less abundant than the latter species.

NATURAL
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Blennius maculatus, Garrett.

D. 12-15; A. 14; V. 3; P. 13; C. 5, 1, 6, 5, 1, 4.

The head comprises one-sixth of the total length. The depth of the body at the origin of the anal fin is not quite equal to the length of the head. The anterior portion of the head is nearly vertical. Eyes circular; their diameter equal to one-third the length of the head, and their orbits slightly elevated above the line of profile so that the inter-ocular space is concave. A small fimbriated appendage may be seen in each orbit and nasal orifices. Lower jaw with posterior hooked canines.

The two dorsal fins are united at their bases, and of nearly equal length, though the soft one is the deepest. The anal commences opposite the eleventh ray of the first dorsal and is not so deep as the fin above. The pectorals reach as far back as the anal fin. The ventrals have a third ray which is rudimentary. The caudal constitutes two-eleventh of the entire length of the fish, and when expanded its hinder margin is convexly rounded.

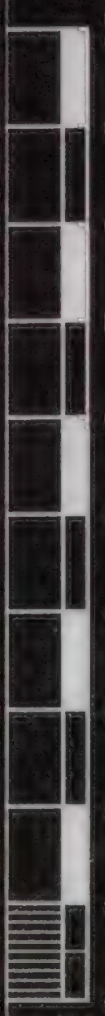
Color: the upper half of the body is light greenish-gray and white beneath; the former maculated with blackish, the spots small and arranged in groups so that when viewed from above the dorsal region has a barred appearance. The lower ground is spotted with pale brown. Occipital region clothed with bluish-white. Cheeks and breasts covered by chrome-yellow reticulations. An oblong vertical blue-black spot behind the eyes. Vides brown. Dorsals pale, the anterior one irregularly spotted with light brown, and the posterior ornamented with wavy stripes, of the same color, running obliquely upward and backward. No upper margin tinged orange. Caudal rays spotted with blackish. Outer half of each anal ray with two black dots. Two dots on each ventral. Pectorals colorless.

Length, 2 to $3\frac{1}{2}$ inches.

Habitat. Society Isls.

Remarks.—The drawing and description are from a specimen $2\frac{1}{2}$ inches long. Larger specimens are deeper colored, the spots more crowded, but the reticulation become more obscure.

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Salarias quadricornis



Salarias edentulus



Salarias marmoratus

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men turned depth. The head falls a little short of a fourth of the total length and the eyes, which are sub-oval in shape approximate the upper line of preopercles. Their greatest diameter as compared to the length of the head is as two to thirteen and they are situated just three times their length from the end of the snout. The lateral line which is rectilinear falls with a gentle descent as far as the second dorsal fin, whence it runs straight to the tail. The hinder corner of the maxillary extends posteriorly to a vertical line cutting the anterior third of the eye. The opercle is rounded, and the hinder margin of the gill opening is very oblique and slightly arched. The lower maxillary teeth are sub-triangular, closely set, graduated either away from the middle of the branches of the jaw and disposed in a single row. The front is armed with two ^{large} approximating recurved lancet shaped fangs, which are received in corresponding sockets in the upper jaw. The premaxillary teeth are also sub-triangular, disposed in a closely-set series and the anterior third of the jaw, on either side, is provided with two lancet-fang shaped fangs, one of which ~~part anterior~~. The palatine teeth are very large and somewhat lancet shaped.

The first dorsal fin commences at a point just midway between the end of the snout and the hinder termination of the second dorsal base. It is higher than long, and the second ray is a little shorter



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than the first, and the others rapidly decreasing in altitude so that the last one is no more than one third as high as the second. The vacant space between the two dorsals equals about one sixth of the total length of the fish, and the second fin occupies the middle of the space between the first dorsal and the base of the caudal fin. The two first rays are undeveloped, the first quite short, and the upper margin of the fin is deeply and obliquely concave. Its height, which equals that of the first fin, is a little more than the length of its own base, and the last ray is slight and long. The anal is similar to the first dorsal but inserted slightly more posteriorly. The small ventrals occupy a point midway between the pectorals and first dorsal fin. The pectorals extend posteriorly as far as the middle of the first dorsal. The caudal is forked about half its length, the forkes pointed and slightly triangular. Two small rounded lobes mark the termination of the middle rays.

Color silvery gray, passing into white on the belly and bluish black along the dorsal region, which latter tint extends as far as the lower third of the body, or numerous vertical closely-set bands. Ventrals silvery. The first dorsal is clouded with steel blue and dusky. The second dorsal and caudal bluish black. Pectorals grayish silver. Ventrals and anal whitish, with obscure dusky mottlings.

Length 6 to 8 feet.

Habitat: Society Isls. Kermadec, Cook.

NATURAL
HISTORY
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Sphyræna Forsteri? Currier

Sphyræna Forsteri? Currier & Kalm, *Hist. Nat.*
des Poiss., Vol. 3, p. 333.

D. 7; A. 5-2/5; P. 3/7; V. 1/5; P. 2/10; C. 5, 1, 3, 1, 4.

This *Sphyræna* is more slender and the head is longer than the preceding species. The upper profile from the snout to the second dorsal fin is nearly horizontal, and rectilinear, and the ventral line is gently arched but less so than *Sphyræna multifasciata*. The greatest depth of the body is about one-eighth of the total length. The head, as compared to the total length of the fish is as two to seven or more exactly a third, caudal fin excluded. ~~The lateral line~~ The eyes are large, a little below the line of profile, sub-circular, and their greatest diameter a little more than a sixth of the length of the head. The snout is longer than the preceding species, and the preopercle is rounded on its exposed margin, which is very oblique and gently arched. The margin of the gill aperture exhibits a vertically truncate edge, beneath which there is a slight oblique emargination in the edge of the subopercle. The hinder end of the maxillary does not ^{quite} reach the anterior border of the eye. The structure and disposition of the teeth differs but little from *multifasciata*.

The first dorsal fin commences midway between the ^{anterior} border of the eye and

cm

0 1 2 3 4 5 6 7 8 9 10

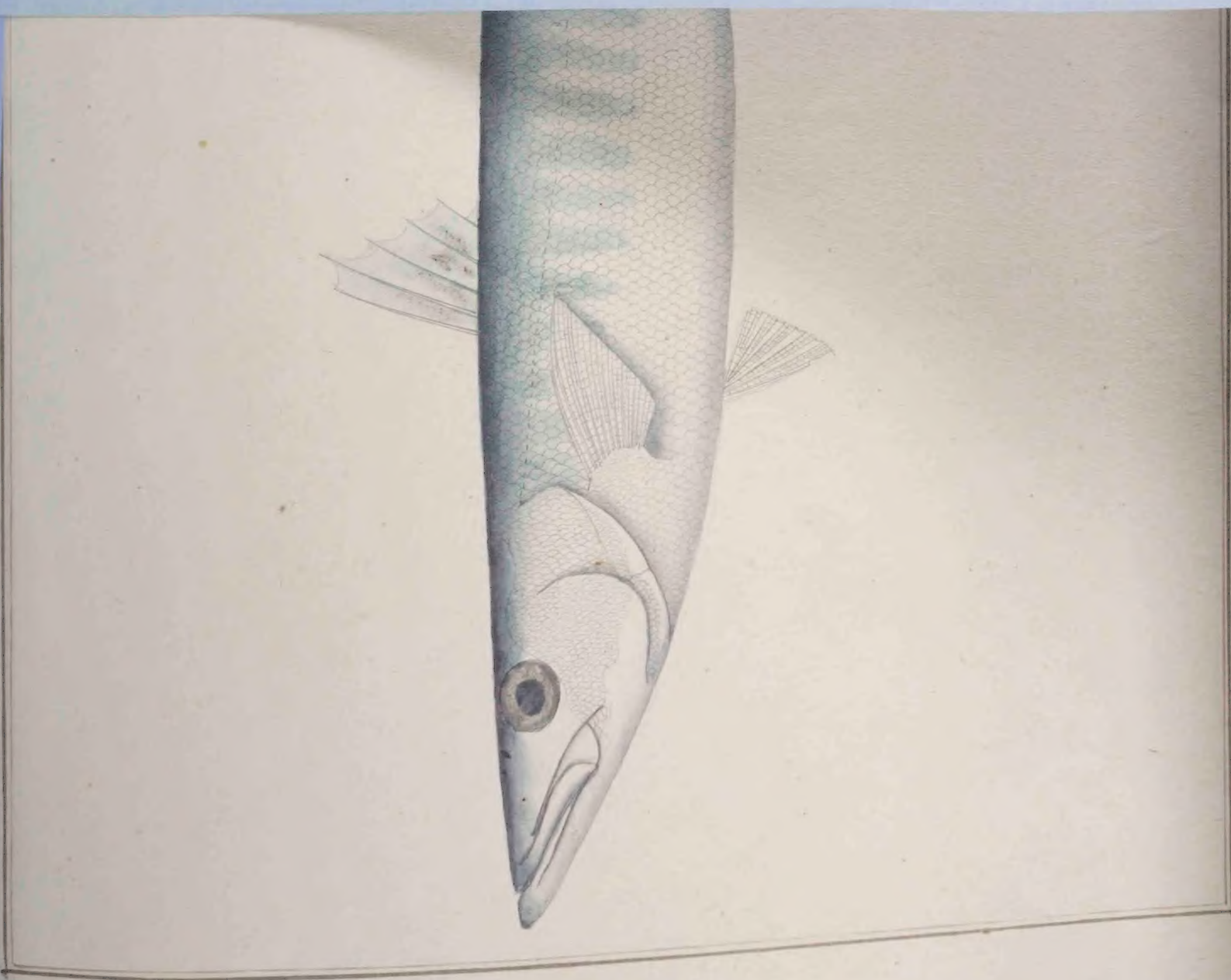
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origin of the soft dorsal. The ~~structure~~ ^{of insertion and} of the two fins together with the anal, are similar to the preceding species, but the caudal exhibits a more profound emargination, which gives the fin a sub-crescent-shaped aspect. The insertion of the soft dorsal and anal corresponds to the multifasciata, though the pectorals only reach as far back as the first ray of the spring dorsal.

Color silvery gray, passing in to white beneath and bluish slate above. Ventrals silver. The two dorsals dusky with a tinge of olive. Caudal bluish slate. Ventrals grayish white. Pectorals light olivaceous, and the anal pale grayish with a dusky tinge.



Sphyrna



Length 3 to 4 feet.

Habitat Society Isls.

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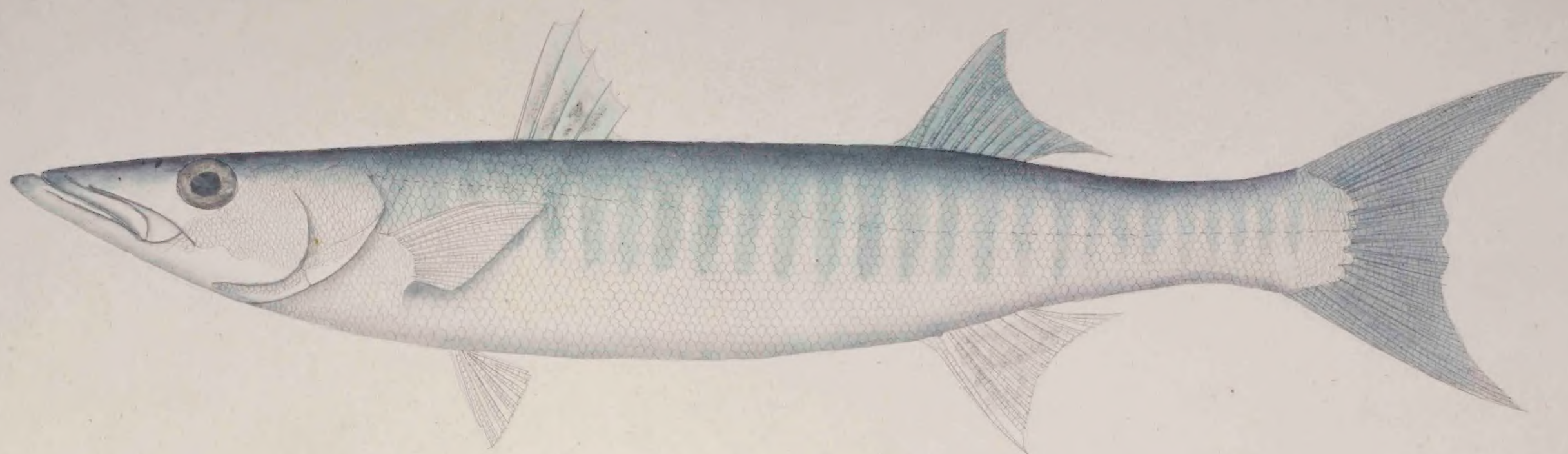
At the above location this species is called
"Patratera". One example weighed 46 lbs.

~~It is native named as "Gathakha".
Large. Long head & very large mouth.
Backs often a much larger
than the body.
Length 82 inches.~~

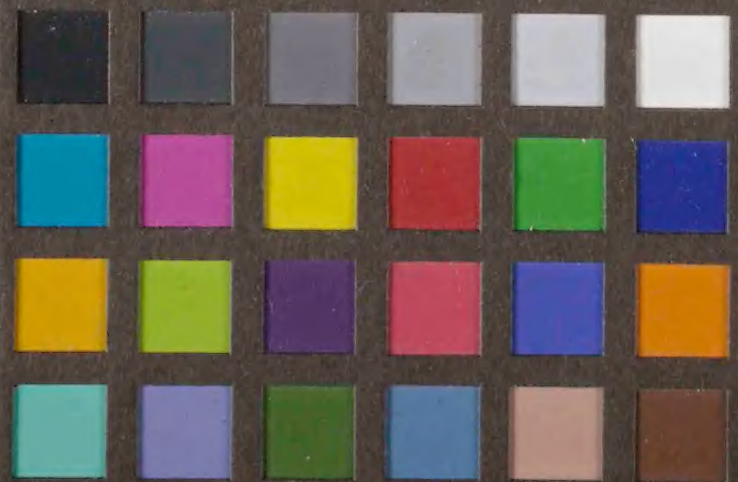
~~snout is white. The lateral line is black.~~
The eyes are
large, a little below the line of profile,
circular, and their greatest diameter
little more than a sixth of the length
of the head. The muzzle is longer than the
ear, and the preopercle less
than the eye, and its exposed margin, which is
oblique and gently arched. The margin
of the gill aperture exhibits a vertically
uneven edge, beneath which there is a
slight oblique emargination in the edge
of the subopercle. The hinder end of the
opercle does not quite reach the
lateral border of the eye. The structure
and disposition of the teeth differs but
little from multifasciata.



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Sphyraena forsteri



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obtusata, Cuv. No 432

Sphyræna lineata, Garrett.

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B. 7; D. 5-10; A. 10; V. 1-5; P. 14; C. 2, 1, 8, 7, 1, 1.

This species is more slender than usual, the greatest depth of the body as compared to the total length is about one to nine, while the thickness is as one to about twelve in length. Both dorsal and abdominal regions are horizontal, and the head, which comprises less than a fourth of the fish, is nearly rectilinear in its upper line of profile. The hinder margin of the gill covers are nearly vertical and slightly waved. The preopercle has its membranous hinder angle considerably prolonged, so that its posterior margin is deeply concave. The eyes are large, sub-circular, their diameter comprising about a fifth of the length of the head, and are situated just two diameters distant from the end of the upper jaw. The mouth and teeth are comparatively smaller than usual in the genus, consequently the hinder tip of the maxillary is considerably in advance of the eyes.

The two dorsal fins are of about equal height, and separated by a free space which equals half the length of the head. The soft dorsal is deeply concave in its upper margin, and its base equals its height. The anal fin is of the same shape and size to the fin above but is situated more posterior. The abdominal space equals one-third of the

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10 9 8 7 6 5 4 3 2 1 cm

